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PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
LONDON, ENG., 88 Fleet St. E.C.


TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VII.

Publication Office : TORONTO, JANUARY 2, 1913

No. 1



THE STANDARD

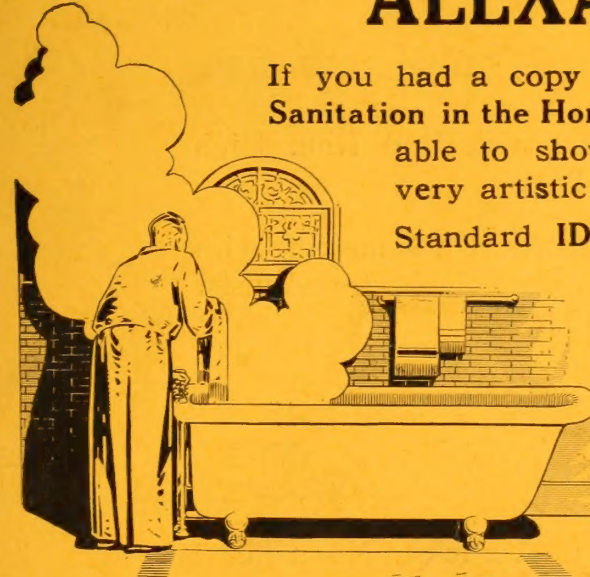
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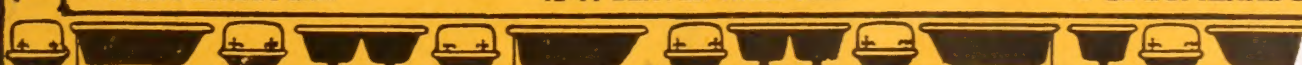
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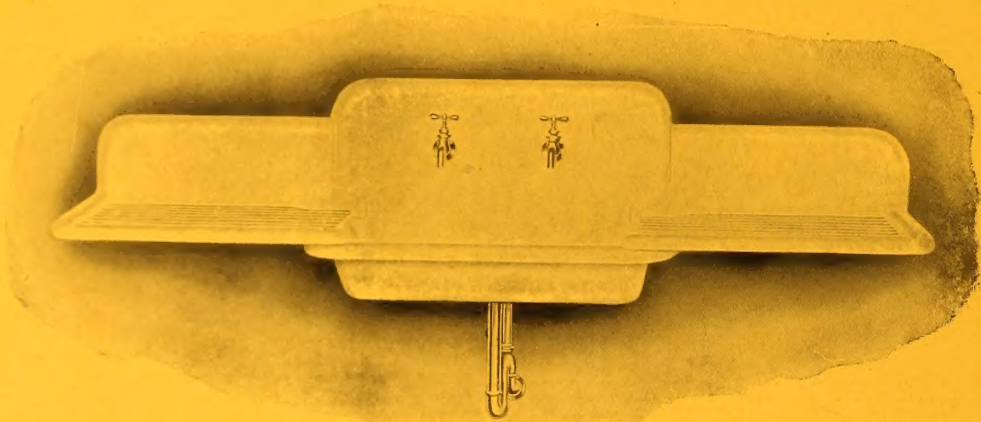


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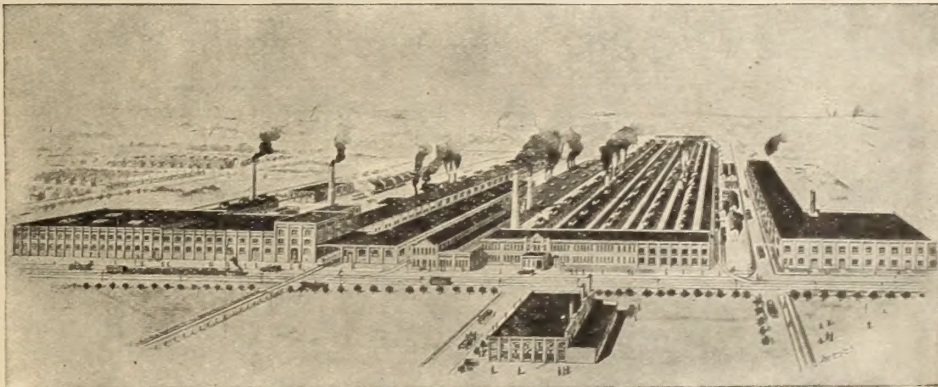
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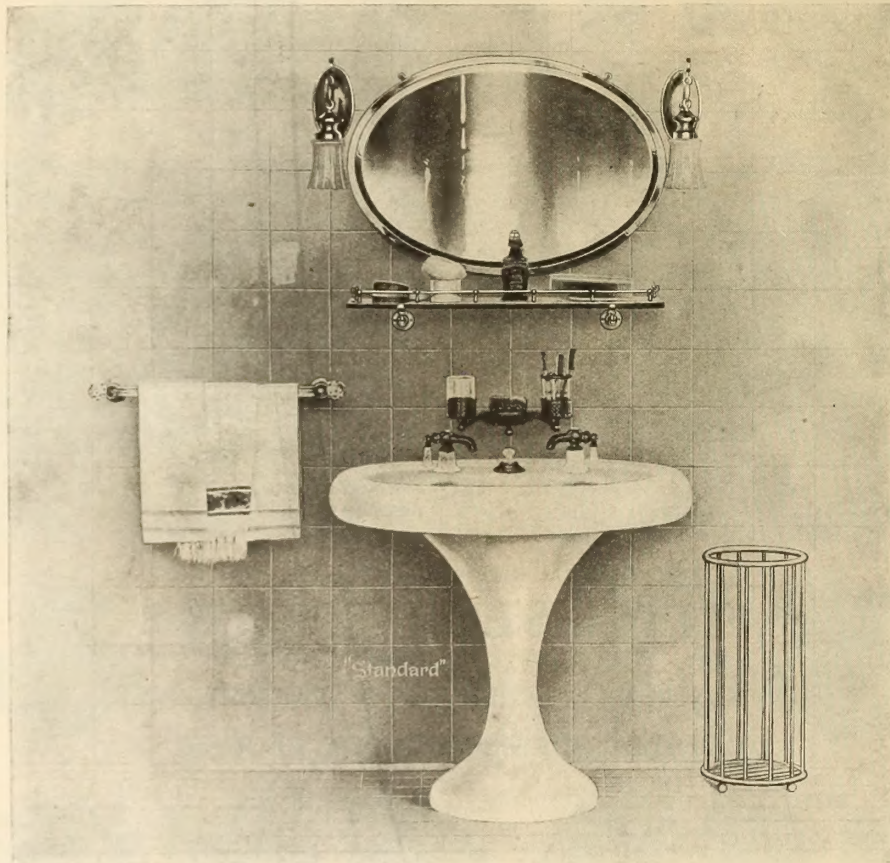


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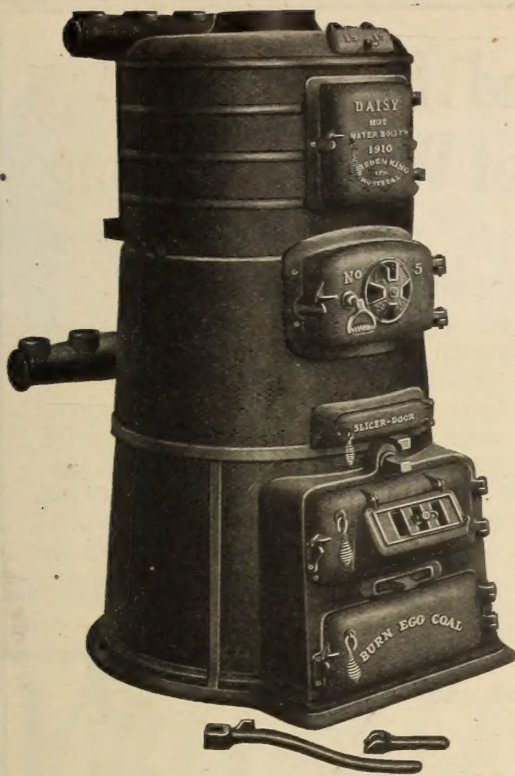
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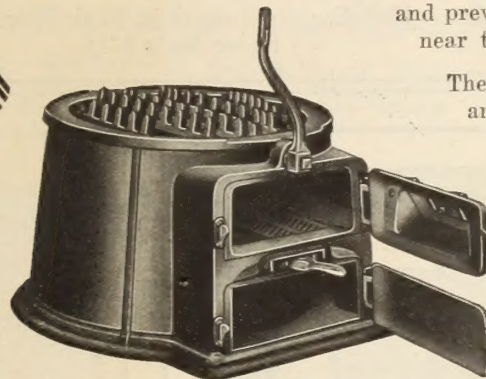
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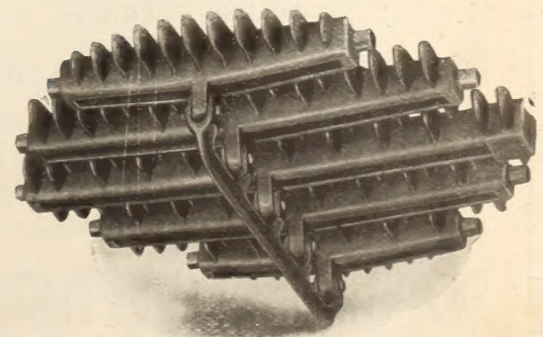
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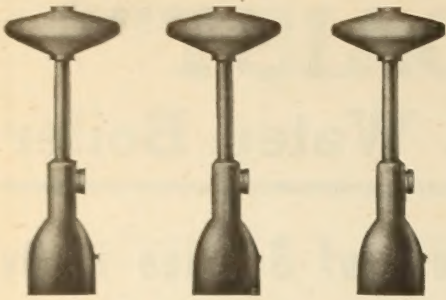
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All these points have been realized and proven by years of trial and thousands of plants in use in all countries.

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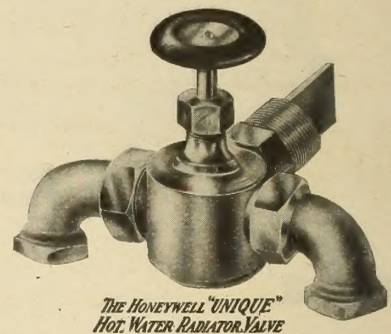
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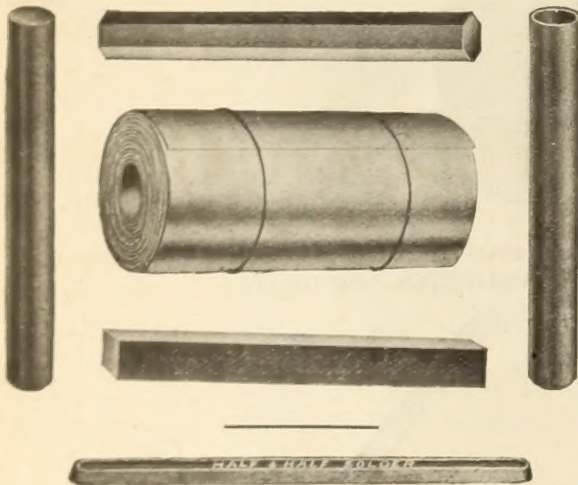
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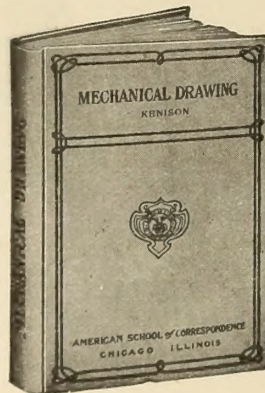


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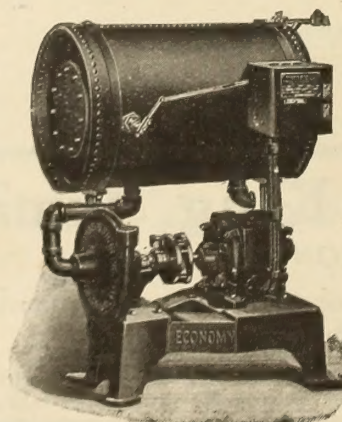
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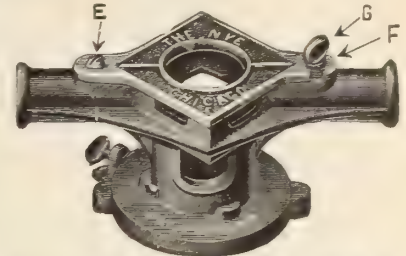
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I will send it, like the Nye Die, on a 10 days' free trial. You can use the tool, and if it is a better stock than your old stock, send me the price. If it isn't, return the tool at my expense. You have lost nothing, and made a monkey of Nye,

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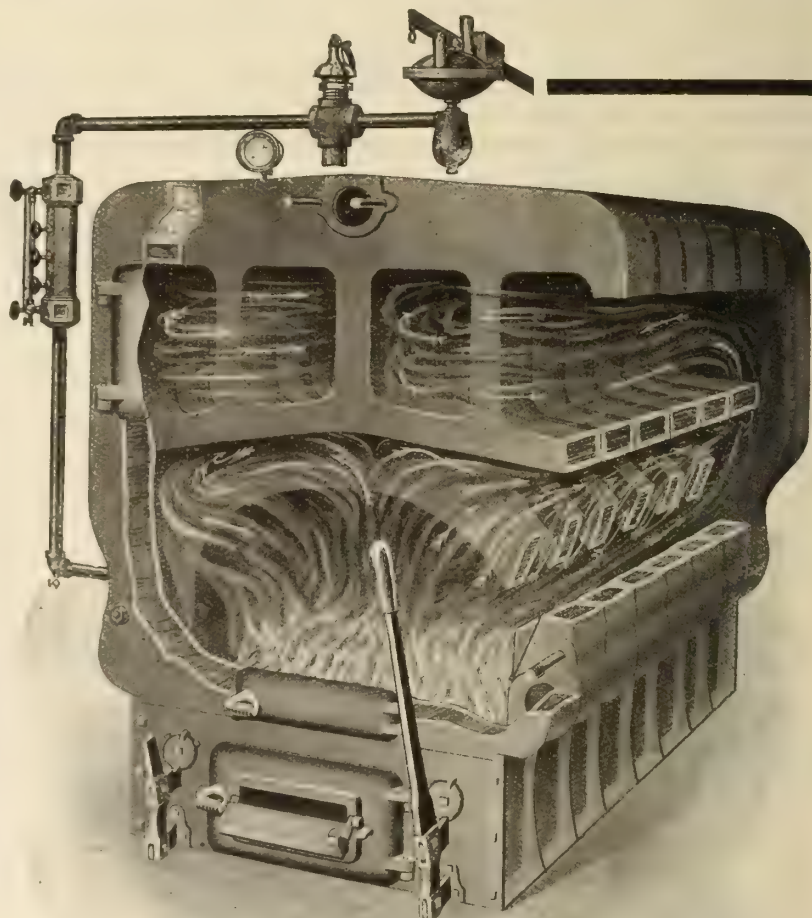
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Prospects for Future are Very Bright

A Brisk and Prosperous Year Is Anticipated—Conditions During 1912 Were Very Satisfactory, Manufacturers Reporting Big Increases—There Are No Stocks on Hand at the Present Time.

On making inquiries with regard to the business of 1912, as a whole optimistic replies have been received such as were never heard of before. It has been a record year in almost every way. Prosperity has made itself felt in every section of the country and in almost every line. Doubt with regard to the future is something little talked of and very general confidence prevails that 1913 will be even a bigger year than the one which is just ended.

Comparing conditions at the opening of this new year with conditions at corresponding times in the past, there is one very marked difference noticeable. In past years there has generally been a very marked lull in trade during the winter months. December, January, February and often even March have been times of little activity for the sanitary and heating engineer with the exception of such times as when very low temperatures caused pipes to burst and brought many rush orders for plumbers. These months too have generally been dull for the manufacturer. Few orders were placed and an excellent opportunity was given to lay in a stock which would meet the increased spring demand.

But not so this year. Both sanitary and heating engineers have been rushed right up to the present time and little indication is given of business decreasing. Manufacturers have never been so rushed. To meet the demand in some

lines has been practically an impossibility, even with enlarged factories and more strenuous efforts put forth to meet conditions. At the present time supplies in many lines are at low water mark and demand is so great that it is almost impossible to get ahead. Summing up conditions this week one manufacturer stated: "Don't know what we're going to do for 1913. Every other year we have had something to start on, but this year we start with nothing—really less than nothing, for we are now behind. We have orders for boilers and radiators which call for shipments away on into 1913, and as for soil pipe, we have enough orders now booked to keep us busy right up till September."

Supplies in all lines are short, but perhaps more particularly in soil pipe, radiators, boilers and lead pipe. One of the features most noticeable then, comparing 1913 with other years, is that manufacturers are entering upon 1913 with a heavy demand and no store of supplies to meet it.

With regard to the business of last year a marked increase is shown over preceding years.

One manufacturer of plumbers' supplies states: "The year just closed shows a very marked increase over our best year in the past."

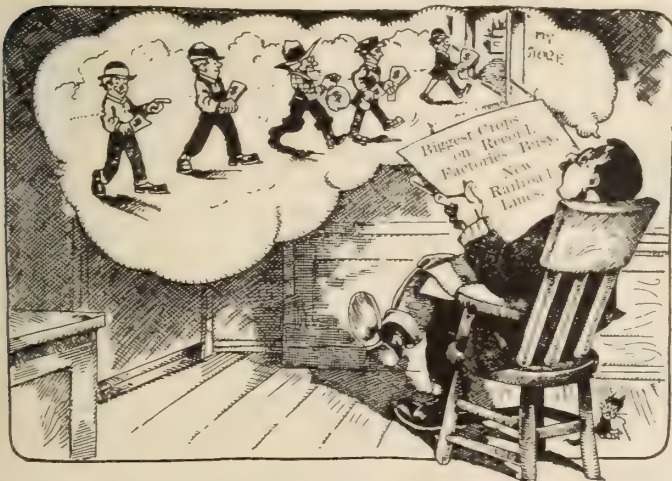
Another manufacturer of brass goods, brass fittings and some plumbers' supplies states: "Our business for 1912

has been more satisfactory than that of 1911, although we have to some extent switched over and are now pushing rather a different line of goods."

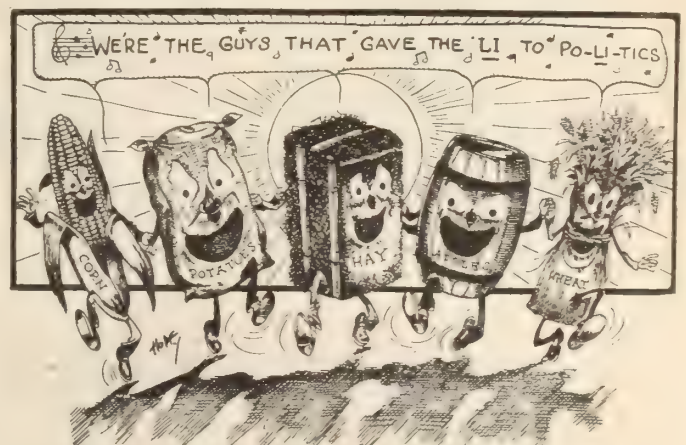
Manufacturers of boilers and radiators make much the same report. One states: "As matters stand we increased our business by about 30 per cent. Had we been able to secure supplies and fill all orders there is no telling what our increase might have been."

These answers are all typical of what manufacturers have to say. The general feeling is that 1912 has been a record year in every line.

With regard to future conditions various opinions are expressed. Some are very optimistic about prospects for 1913 and see no reason why even greater prosperity than has prevailed during 1912 should not reign during the coming year. The amount of building this year has been so great that those who are counting on building next year are letting out contracts and making all arrangements early so that buildings will be ready at such time as they are wanted. Judging from the number of orders already received for furnaces, radiators, soil pipe, etc. (and with all of these dates and specifications have to be submitted) the amount of building during 1913 will be very large. Prospects are of the brightest. "With the amount of work still to be done and the number of orders already being placed, I don't see where there is going to be any slack



Is it any wonder that the sanitary and heating engineer dreams of prosperity.



An American cartoonist idea of the reason why politics failed to effect business in the United States last Fall.

PLUMBER AND STEAMFITTER

season at all this winter," said one manufacturer recently.

To state what the future in prices will be is a matter of great difficulty but if the demand proves to be as now anticipated there seems little reason to expect anything but higher prices to prevail. Scarcity and high prices in pig iron together with similar or even more marked conditions in coke have done much to advance prices in many lines and even further advances are anticipated. Altogether, conditions at the opening of this new year are such as have never been paralleled in the past, and greatest trade activity is anticipated.

NEW PLANT COMPLETED.

The H. W. Johns-Manville Co. of New York, manufacturers of asbestos and

magnesia products, have recently completed their new plant at Manville, N.J., and will begin operations with the new year.

The new Manville plant consists of nine buildings, which, together with their products, are classified as follows: A—Textile and Packing. B—Rubber Plant; Electrical Specialties and Printing Department. C—Pipe Coverings. D—Paper Mill. E—Magnesia. F—Roofing. G—Mastic and Waterproofing. H—Roofing Coatings, Power Plant and Pump House.

These buildings represent the most advanced ideas in fireproof construction, being of brick, steel and concrete with fireproof roofing. They are planned so as to afford best operating conditions for employees as well as perfect safety.

Special precautions have been taken with regard to ventilation and sanitary conditions so that a constant supply of fresh air is provided without causing drafts.

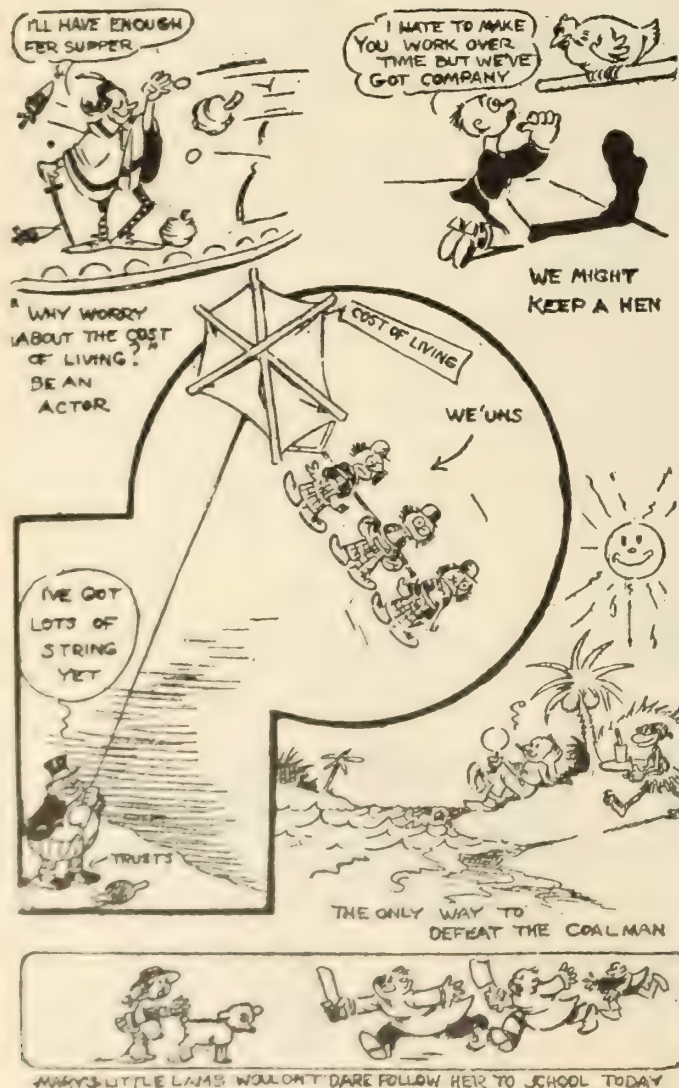
Each building has an average length of 1,000 feet. The total combined floor area of all the buildings is about 1,000,000 square feet.

Special arrangements have been made with all railroads entering Manville to connect with the company's private railroad system, thereby insuring excellent shipping facilities. These railroads have made preparations to operate special work trains to and from Manville for the accommodation of employees who live in nearby towns.

About 3,000 men will be employed at this new plant, making a total of about 7,000 who are now employed by this company.

SOME SUGGESTIONS

From Toronto News



It is agreed that the cost of living will continue to advance during the coming year.

EXTENSION TO PLANT.

The Empire Mfg. Co., of London, Ont., brass founders and makers of plumbers' fittings, during the past year, have added to their new plant a new one storey and basement building measuring 150 ft. by 50 ft.

The new building is of reinforced concrete and forms a smelting room, metal stores and laboratory. The whole foundry is laid out in a thoroughly modern way with a view to economically turning out high grade castings in large numbers several labor saving devices are employed. Trucks carrying the ingot molds run on a track alongside the furnace, and the molds are poured direct from the furnace without the intervention of a ladle. These are then delivered direct to the foundry. The three furnaces for brass melting have a hood over them by means of which the waste heat is drawn off by suction fans and used for drying cores.

As a whole the company's machine shop is very completely equipped for rapid and accurate production.

Holding a Banquet.

The St. John Master Plumbers' Association intend holding a banquet in Victoria Hall, St. John, N.B., on Wednesday, January 8, at nine p.m.

Swanson-McDonald.

On Monday, Dec. 23, Norman Swanson, sanitary and heating engineer, of 42 Bradshaw avenue, Toronto, joined hands in matrimony with Miss Annie McDonald, also of Toronto.

Christmas Tree Festivities at Toronto

Members of Society Foregather and Spend a Jolly Evening — Band Led by Lewis Legrow Was the Feature—Frank Maxwell the Recipient of Gifts on Behalf of the Society for Services as President.

The largest number on record within several years was present at the banquet and Christmas tree held by the Toronto Society of Sanitary and Heating Engineers in the Albert Williams Assembly Parlors on the evening of Dec. 19. Not only were there a very large majority of the members of the society present, but through the kindness of the committee looking after the evening's programme invitations were extended to all the manufacturing and supply houses and these were well represented. From Guelph came A. Malcolm, F. Smith and Geo. G. B. Grinyer to share in the festivities of the evening. Ald. Harry Mahoney, also of Guelph, sent his regrets that he would not be able to be present having that evening to attend a public meeting in his own city.

After a very sumptuous repast, a musical programme for the evening was entered upon, and selections of various classes and descriptions were rendered. The Plumbers' Band trained specially for the evening by their leader E. Lewis Legrow, made one of the most striking features of the programme. Arrayed in costumes of various colors and with instruments which would puzzle an accomplished musician to describe, they poured forth volumes of music to the very great amusement of all present. Mr. Legrow, the leader of the band, was certainly a master in his art and might well consider following it up still further, with the prospect of displacing Sousa, Dan Godfrey, et al. Upon entering he spoke of the great fame which the band had attained in its travels, but the records of which he spoke were far out-classed by their excellent performance that evening.

In addition to the Plumbers' Band several very pleasing selections were given by Jas. Fiddes, tenor; Vernon Gearing, bass, and a quartette made up of H. G. Waterman, Jno. E. Fullerton, V. Gearing and Mr. Riley. A couple of guitar and mandolin selections given by F. Longo and J. Gretta were amongst the finest of the evening and were loudly applauded by all the boys. A. E. Melhuish on the sliding trombone and Mr. Mason on the cornet also proved themselves masters in their arts.

The Christmas tree formed a very large item on the evening's programme. Frank R. Maxwell acting as Santa Claus was welcomed by the Plumbers' Band, and in a brief address, before commencing to present his gifts, strongly advocated the keeping up of the social even-

ings not only as a source of amusement but also as a factor in keeping the society together and helping to make the society useful to each and every member. The social evening, he claimed, was one of the society's most valuable assets and in order that the society should grow and prosper and become of real value to the plumbing profession it should under no condition be allowed to drop.

Presents in large numbers came from Santa's bundle, until everyone in the hall had received a gift from his hands. Many were specially appropriate to the men to whom they were given. H. G. Waterman, who will in all probability be president of the local society next year, received a large gavel, which no doubt he will find very useful in his new capacity. If size counts for anything Mr. Waterman should now be well equipped. The gavel was one especially constructed from a small wine keg, and a broom handle. With it the new president will appear very formidable indeed. Although it is provided with a four-foot handle it is to be hoped that Mr. Waterman will have no occasion to use it for purposes other than those intended.

Throughout the evening merriment reigned supreme. Towards the close, however, the element of frivolity was suppressed for a few moments while Mr. McMichael, on behalf of the members of the society, presented Mr. Maxwell with a case containing three handsome brier pipes. And following that a cut glass berry bowl also from "the boys" was presented by Mr. Clare to Mr. Maxwell for Mrs. Maxwell.

For the past year Mr. Maxwell has been president of the local branch and has continually put forth untiring efforts to advance the interests of the society and make every meeting a success. The very hearty applause with which he was greeted at the time of the presentation showed to a slight extent the high degree of popularity which he has attained amongst the other members of his profession.

Another selection from the Plumbers' Band brought the programme to an end. The band though now dispersed and occupied by various interests made a very remarkable impression on their audience and will again be welcomed any time their leader can gather them together.

The following were the members of the committee looking after the evening's

entertainment: J. T. Aggett, Geo. Cooper, J. Fullerton, Wm. Mansell, A. F. Passmore and J. Wright.

* * *

At the next meeting of the Toronto Society of Sanitary and Heating Engineers elections for the new executive for 1913 will be held. A very full attendance is requested.



INSTANTANEOUS HEATER CAPACITY.

Editor, Plumber and Steamfitter.—Will you be kind enough to give me some idea as to the quantity of hot water that some of the instantaneous heaters will furnish in any certain amount of time?—G. H. B.

We believe that the actual amount furnished would depend upon the size of the heater and perhaps somewhat upon the make. Speaking, however, in a general way, it can be stated that the amount of hot water would vary from about 90 or 100 gallons per hour in the smaller sizes to something like 350 to 400 gallons an hour in the largest sizes. You must remember, however, that this water is not heated to the boiling point, but is heated hot enough for bathing or other household purposes. The heaters are generally supposed to raise the temperature about 50 degrees, or from what is figured as ordinary temperature (62 degrees) to about 112 degrees Fah.—D. C. H.



HOW MUCH GAS WILL A WATER HEATER USE?

Editor, Plumber and Steamfitter.—I would like to ask you if you can tell me how much gas one of the water heaters will use, one of the kind that heats the water as it passes through the heater?—A. J. D.

We presume that our correspondent refers to that type of heater known as the instantaneous heater and would answer that generally, these heaters are supposed to consume about one cubic foot in heating a gallon of water warm enough for use for domestic purposes. We believe that there are some types that consume a less amount than mentioned but do not have the exact figures available at moment of publication.—D. C. H.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto Atabek, London, Eng.

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Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, JANUARY 2, 1913

The Year Ahead

The new year, 1913, has begun. Sizing up conditions in the past and present and as far as possible estimating what the future will be, the only conclusion which can be reached is that the outlook is exceptionally bright. This is confined in no way, and is applicable all over Canada from coast to coast. Never before did such prosperous conditions prevail or was a new year entered upon with prosperity spelt so clearly across the horizon. During the year which has just been completed, great momentum has been gained, and this, with the success achieved during 1912 and the inspiring outlook for 1913, ought to dispel fear and pessimism from every mind, so that the new year should prove the best on record in industrial Canada.

In the past a very marked lull in business has generally greeted the new year and continued to prevail for some weeks afterwards, but this year commences with activity on every hand, and with every prospect for a prolonged enjoyment of such conditions.

The general view is to regard the year that is past not only very favorably, but as one of very marked success. Throughout the year success has stimulated men to further action and one successful venture leads only to another of the same. In such a state of mind are we entering upon the new year. Prosperity reigns unchecked and the stimulus of the past urges on to even greater achievements in the year to come.

Now or within a very short time it will be possible to determine with a greater or less degree of exactitude the volume of business accomplished during the past year. Building has been carried on more extensively than during any other year in the past, and as a result the sanitary and heating engineers have been exceptionally busy. Even now everything goes to show that 1912 is the biggest year on record. And under present circumstances there is every reason to believe that the same conditions will continue and prevail throughout the year that is ahead.

New Year Resolutions

Upon entering a new year it has become a very common practice to form new resolutions regarding future conduct. A desire to forget the mistakes of the past naturally comes over one, and with it a determination to do better during the new year. Too often such resolutions seem made only to be broken. Where the trouble really lies is that after the first failure in the new year too often there is a tendency to give up striving, and to fall back into the old and easy ways of the past, regardless of what should be. Everyone makes mistakes, but as Josh Billings says, "Success don't konsist in never makin' blunders, but in never makin' the same one twict." Or as another worthy has put it, "He who never makes a mistake, never makes anything. Wise men make mistakes; fools continue to make mistakes."

There are plenty of resolutions which are really worth while, and plenty more which are only of slight importance. But there is one thing which is of supreme importance. Give your resolution careful thought before you make it, then go at it with determination to do or die. It is only thus you will succeed.

* * *

Here's the best New Year's resolution of all: To make no new resolutions that I do not intend to keep every day for the next year and every hour of every day.

* * *

An ounce of prevention is worth a pound of cure when it comes down to the fire question. If the ounce of prevention were applied, the pound of cure would become almost unnecessary. When will taxpayers begin to realize this fact?

* * *

Like the poor, the pessimist is always with us. He can be heard nowadays grumbling about the tightness of money, and shaking his head gloomily on the prospects for the coming year. But this undertone of dissatisfaction is drowned in the general chorus of optimism and cheery confidence is heard on all sides.

Various Styles of Closets Defined

The Exact Difference Explained Between Syphon-Jet and Washdown Closets
—A Matter Which is Frequently Misunderstood.

THE exact difference between a syphon-jet and a washdown closet is one which seems to be very generally misunderstood. That there must be a difference, anyone is willing to admit, but on being asked to explain it, the answer which naturally comes to the lips of most plumbers and salesmen alike is the difference in price—4, 6 or 7 dollars as the case may be. To go into an explanation further than that seems to involve so much difficulty that few attempt it.

Now there is a difference, and a very great one, between a syphon-jet and a washdown closet. But before an explanation of that is entered upon there is some slight confusion of terms which must be cleared up. Ordinarily when the term washdown is used, it is applied to the washdown closet with syphonic action and not to the closet where no syphonic action takes place. There are the three main classes, namely syphon-jet, syphon washdown and washdown.

The main difference between the syphon-jet and syphon washdown closets is a difference in the way in which

soon as the button is pressed and more water is allowed to rush in, water immediately begins to flow over the dam and down the outlet. Passing along through the different twists and turns in the leg, it is very much hampered.

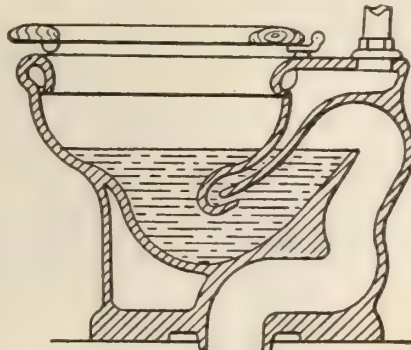


Fig. 2.

The water keeps pressing in from behind faster than it is allowed to pass out and thus the water accumulates until finally all the air is expelled from the deflection chamber and a plug of water is formed. It is only after the formation of this plug that syphonic action begins. The pressure of the air on the surface of the water in the bowl forces the water over the dam and down the outlet. Syphonic action continues until the water gets so low in the bowl that the air is allowed to get over the dam and down the outlet again. More water flowing in from the tank again fills the bowl up to the level of the top of the dam.

To secure syphonic action the one essential is to form the plug of water in the outlet. In the syphon washdown closet this is accomplished altogether by the windings and turnings in the leg, restricting the passage of the water.

In the syphon washdown the time during which syphonic action takes place is comparatively short. The action is strongest when the water reaches its lowest level in the bowl. But as soon as the water reaches that level air is allowed to pass in and put a stop to all syphonic action.

Coming to the syphon-jet type as illustrated in Fig. 2, matters are a little more complicated. Upon the button being pressed the water begins to rush in from two directions, from the top of the bowl as in the washdown type and also from the jet. The main object of the jet is to start movement in the water in the bottom of the bowl and by rushing up from beneath to force some of the

water over the dam. In the illustration, note the curves and restrictions in the outlet. In passing along, the water is knocked from one side to the other and thus greatly retarded. Some types of syphon-jets show even greater angles and restrictions than the one here illustrated. But in all, a solid plug of water is rapidly formed and thus syphonic action is speedily accomplished. The jet does much to bring about this speedy action by forcing the water up over the dam. It is directly a mechanical means towards an end.

The jet also increases the strength of the syphonic action. As in the syphon washdown type, syphonic action is strongest when the water reaches its lowest level in the bowl. In the syphon-jet closet the jet, by sending water up over the dam keeps the water in the bowl at this low level for some continued length of time, and thus produces very strong syphonic action.

In the type shown, the jet is concealed, and cannot be seen from looking down into the bowl. In many cases, however, the jet comes up right in the bottom of the bowl and may readily be seen. The action in both cases is very similar, the jet serving the same pur-

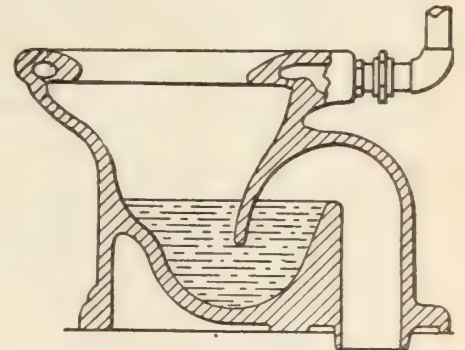


Fig. 3.

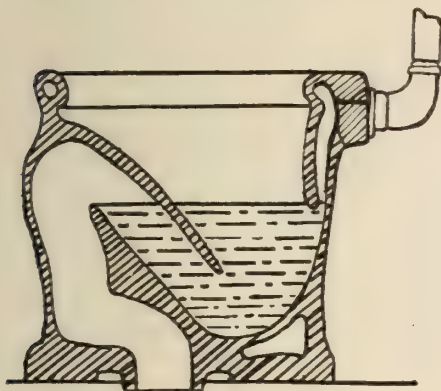


Fig. 1.

syphonic action is produced. To gain syphonic action at all the water must be restricted in the trap and a solid plug of water formed. This plug of water removes the air pressure from the lower side of the trap. Atmospheric pressure on the water in the bowl, then, does the rest. Being greater than the pressure from beneath it forces the water down: the result being the flushing of the closet.

Fig. 1 is an illustration of one form of washdown closet with syphonic action. All the water comes in, in this type, from the top of the bowl. Before the button is pressed, the water stands on a level with the top of the dam. As

pose whether placed in the one position or the other.

Syphonic action is produced more rapidly in the syphonic jet than in the washdown closet and also continues during a greater period of time. Thus it may also be said to have greater force through lasting longer.

One of the differences between the two types most easily noticed is the action of the water in the bowl. Upon the button being pressed in the washdown type the water immediately begins to rise, and rises to a level considerably higher than that of the top of the dam. In the syphon-jet type, however, the water immediately recedes, owing to

the action of the jet from beneath forcing the water over the dam.

One of the main advantages of the syphon-jet is that it has a large and deep bowl. The water seal is greater. This fact not only makes it easier to keep clean, but also goes a long way in preventing it from becoming dirty.

In the washdown closet, the trap is right under the bowl and thus goes into very small space, while in the syphon-jet a considerable part of the trap is beyond the bowl. Or in other words, there is a difference in length from back to front between the syphon jet and washdown closets, the former being four or five inches longer than the latter. This is important in two ways. In the first place, greater length allows a greater depth of seal. And the second result of the fact is the difference in cost.

The amount of material employed in making the two types of closets differs very slightly, and at best it is only clay. The amount of labor in moulding a syphon-jet is slightly greater than that taken to mould a washdown, but the difference is not great enough to effect much difference in price. Where the real difference in cost of output comes, is in the space occupied in the kilns. As the syphon-jet type is four or five inches longer than the washdown type it occupies that much more space in the kilns. In a large kiln that difference in each would amount up to a great total. The difference in cost of the two closets then is caused essentially by the difference in the amount of space taken up in the kilns.

Fig. 3 shows an illustration of the washdown closet without any syphonic action. Here the closet is flushed simply by the water flowing into the bowl and over the dam. Only the force of the water from above cleans out the bowl at all, and thus to make this type at all satisfactory the supply tank would need to be situated high above the closet so as to allow the water to gain force in falling.

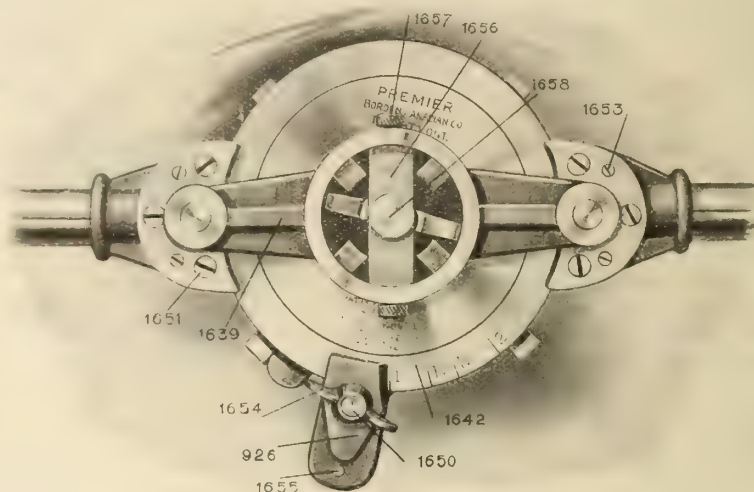
A NEW CANADIAN DIE STOCK.

THE Borden-Canadian Company, Toronto, report a gratifying increase of business during 1912, their shop having been forced to its utmost capacity. The company have within the past six weeks put upon the market a new die stock of their own design, which is meeting with a very favorable reception. This has been named the "Premier," and is of the automatic release type; so that as

ciently far on to the pipe to complete a standard (Briggs) length of thread, they release themselves from the work and the tool is removed without the necessity of running it back over the threads. Much valuable time is thus saved and all risk of damage to the dies or thread is entirely avoided.

Another feature of the Premier die stock is the absence of the usual leader screw, the function of which is in this

The Premier die stock is well designed and strongly made. All parts are of steel, including the body, which is a steel casting. The use of this material enables a considerable amount of metal to be omitted around the circumference of the body, thus reducing weight and greatly facilitating the oiling of the dies. The automatic throw-off can be quickly removed when it is desired to cut straight and running lock nut threads.



BORDEN-CANADIAN CO. NEW "PREMIER" DIE STOCK.

tool performed by the dies themselves. The latter are of a special patented form made in two steps. The first set of teeth start the thread and draw the die stock forward on the pipe, while the second set cut the full thread, the taper being obtained by the automatically expanding movement given the dies as they advance on the pipe. The absence of a leader screw enables the die stock to be made much shorter than usual, so that it is possible to thread a nipple $5\frac{1}{2}$ inches long without the use of a nipple holder.

The centering device is very simple. It consists of a scroll cam, without locks, which operates three jaws that guide the die stock on the pipe. No loose bushings are used. The stock, with one set of dies, will thread pipe 1 inch to 2 inches in diameter, either right or left hand thread. This is accomplished by having the dies chased for R.H. thread at one end and for L.H. thread at the other, and reversing them as required. By the use of one extra set of dies, the same stock will thread any pipe from $\frac{1}{2}$ inch to 2 inches inclusive; while by the use of special dies, bolts, etc., may be threaded. This is one of the advantages of the absence of a leader screw, which would, of course, render impossible the threading of any screw differing in pitch from the leader.

TESTED PRESSURE OF WATER-BACKS.

Editor, Plumber and Steamfitter.—Can you tell me if waterbacks and waterfronts are ever tested and at what pressure they are tested to?—C. Oleson.

They are supposed to be tested to stand a much greater pressure than they will ever be subjected to. You can easily see why this would be for, when made, the manufacturer does not know just where the water back or water front will be used nor the pressure. In some cases it might not be more than 25 pounds while in others it might be over 125 pounds. These waterbacks are designed to withstand a pressure of something like 700 pounds. The next time one explodes in your vicinity, remember the force that has been generated to burst the apparatus.—D.C.H.

New Firm Start.

A new plumbing and steamfitting business has been started up in the town of Fort Francis, Ont., under the name of Heath & Son. The firm intend erecting a new building at the corner of Mowat and First Streets and will there conduct their business.

Ed. Higginbottom, of Port Arthur, spent a few days in Toronto this week.

Tips for Helpers---By "Phoenix"

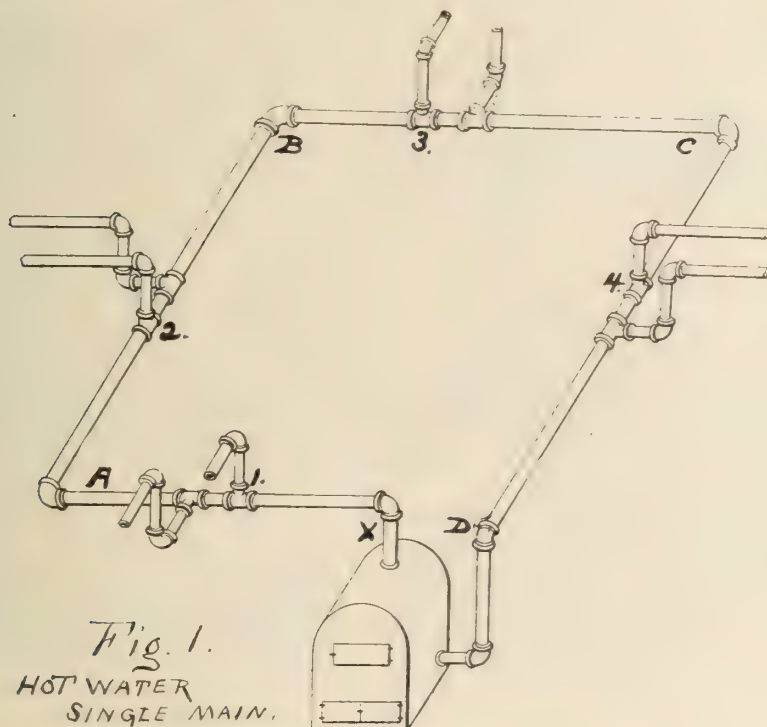
INSTALLING A HOT WATER JOB.

In serving your "time" as a helper you will discover that not every steam-fitter is a good hot water fitter by any manner of means. Good hot water fitters are more numerous to-day than ten or fifteen years ago but it was simply a case of having to come to it because of the rapid growth of hot water heating in popular favor.

With good planning and proper attention to certain details there are few reasons why hot water fitting should not be done as satisfactorily as steam heating. The results in many cases when the

I can well remember the time (but a few years ago, too, be it said) that such a job was called impossible. It was stated that the water could not circulate; that it went both ways in the single main and a whole lot of other things not worthy of talking about right here.

This job shown in Fig. 1 may be called a small typical job and there have been installed all over America many hot water jobs which resemble, speaking generally, this particular style. My own observation has been that they run to the parts of the country wherein the milder climate prevails.



work is well done are more pleasing to certain classes of customers who desire this kind of heat.

Therefore, in order to become a first-class fitter it is now necessary to be a good hot water man. Notwithstanding all that has been written and said upon this subject there is a tendency among some to slight hot water work and the result is that there are many leaks, trapped pipes leading to radiators that will not heat and also slow heating jobs from various causes.

Result, the condemnation of hot water heating and a most thorough cussing of the man that put in the work. In the drawing shown in Fig. 1 we have a simple hot water job with but one main.

In starting this job I should say that the first thing to be done would be for the fitter to be able to DRAW the job on paper. I do not mean that it would have to be drawn EXACTLY as shown in the illustration given; but just the same the fitter will come nearer knowing what he has to do if he can put down on paper his ideas.

It will save mistakes all along the line. I say this, too, well knowing that, in the majority of cases, he will be given a blue print of the job before he starts. To save time and talk we will assume that the tools and material are on the job.

The proper location of the bench is a very important point. Light, sufficient

room in which to work and so placing the bench that it will come as near being in the centre of all the tramping are some of the points to be considered.

Then comes laying out the main and getting it into place. The best practice is to get out the entire main before you put up a single piece.

The hangers can be put up before getting the main into place. This means that no temporary hangers should be used if it is possible to avoid it and it is if planned right.

In the figure shown notice the numbers "1, 2, 3 and 4." You will see that the branches are taken out from the top of the main. On a small job similar to the one shown it would probably make no difference if this plan were followed for the branches supplying the radiators, but on a larger installation it will favor the last radiators on the line if those first taken off are taken from the side of the main—directly from the side at first and taken by 45's as one gets farther from the boiler.

The return from the radiator is taken into the main at the side as will be seen from looking at the drawing.

Now as for this hot water main being any more difficult to put into place and make tight than is a steam main I submit that it certainly is not if care be taken. Set all the fittings on the pipes at the bench as far as possible. Take the measures for the different pieces for the entire main and go to work and cut it out, numbering the pieces in the order in which they will be used.

Be sure and see that the dies are properly adjusted and that none of the fittings are cracked or have sand holes in them. Then make up the main with care. Screw the pipes firmly to place. A good fitter will know just when to stop without leaving the piece too loose nor yet turning it so tight that, when heated, the expansion will cause the fitting to crack.

Now if the mains, branches, risers and other connections be put together with this same care there is small chance of having any leaks on the job. On this point directly over the boiler. It will work. I have put up too many of them after this manner not to know that they must succeed.

The boiler? Well, that is a topic all by itself. Just use the same care in set-

(Continued on page 18.)



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

DISPOSAL OF GARBAGE.

Editor, Plumber and Steamfitter.—I wish that you would show how to easily dispose of the papers and garbage that accumulate?—M. M.

We show in Fig. 1, a type of heater used for this purpose. A close examination of the cut will show how it accomplishes the purpose.—D. C. H.

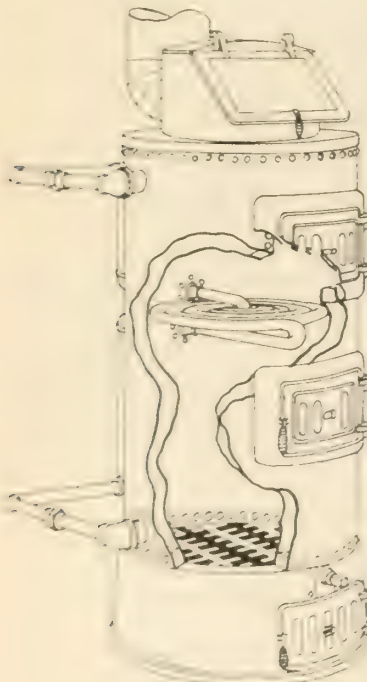


Fig. 1

FLOOR REGISTER vs. SIDE WALL REGISTER.

Editor, Plumber and Steamfitter.—Have you a number of the Plumber and Steamfitter dealing with the advantages and disadvantages of floor registers and side wall registers for hot air heating? Any information will oblige.

Ripley, Ont.

D. M.

At present writing we do not recall any special number in which this matter has been discussed but can state so far as heating is concerned there is no difference between the two. Each register has its own advantages and disadvantages however.

The floor register becomes a very convenient receptacle for dust at all times as well as being a handy means of disposing of all small rubbish. Through people standing over it with damp feet even the nicked register soon becomes rusty. Then again the floor, and carpets if used, have to be cut. A deflector cannot conveniently be used consequently the walls and ceiling are liable to become discolored.

With the wall register less dust is collected and less kept in circulation. Unless a deflector is used, however, the hot air in passing up the wall marks the wall badly. These are some of the practical points that occur to us at the moment.—D.C.H.

A RADIATOR'S SIZE.

Editor, Plumber and Steamfitter.—When we say that a radiator "has 40 feet of heating surface," just what do we mean? I know that we generally express it that way, but I do not believe that every one can tell what it means. Please explain.—John Rauser.

It means the amount of outside surface on the radiator. Thus in your radiator mentioned there would be 40 square feet of outside surface that was exposed to the air. A 50-ft. radiator would mean 50 feet exposed to the air and so on through the various sizes.—D. C. H.

PIPE SUPPLY SIZES FOR INDIRECT RADIATION.

Editor, Plumber and Steamfitter.—I wish that you would state the right sizes for the supply pipes for indirect radiators and greatly oblige.—A Reader.

One prominent authority states that the following sizes will work out well:—30 sq. ft. or under....1 and 1/4 in. pipe
31 to 50 sq. ft.....1 and 1/2 in. pipe
51 to 100 sq. ft.....2 in. pipe.

We should regard these sizes as ample. Indeed we have observed jobs of indirect setting where the supply pipes were much smaller and everything seemed to work out all right. For instance we have seen indirects of some 60 sq. ft. working smoothly on a 1 and 1/4 inch supply pipe.—D. C. H.

COIL HAS A "HUMP" IN THE MIDDLE.

Editor, Plumber and Steamfitter.—I have a coil made as shown by an enclosed drawing (Fig. 3). Now when the heat goes through this coil it seems to swell and has a regular hump in the middle. What can be done in the matter?—R. G. Page.

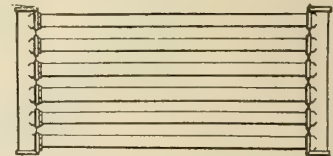


Fig. 3

If the coil is made and fixed to place and resembles the one shown in Fig. 3, we believe that the best thing you can do is to take it out and have one built similar to the one we show in Fig. 2, which will take care of the expansion which is your trouble.—D. C. H.

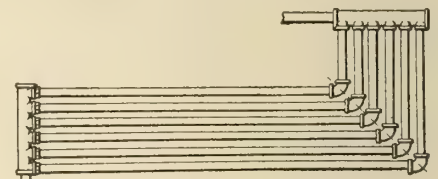


Fig. 2

NAMES OF OFFICERS.

Editor, Plumber and Steamfitter.—Will you kindly furnish us with the names of the officers of the different master plumbers' associations for the Dominion of Canada.

C. E. S.

Canadian Society of Domestic Sanitary and Heating Engineers,—President, E. P. Young, Calgary, Alta.; Vice-Pres., H. Mahoney, Guelph, Ont.; Secretary, J. Marr, Calgary, Ont.

Ontario Society of Domestic Sanitary and Heating Engineers,—President, E. Lewis LeGrow, Vice-President, F. R. Maxwell; Secretary-treasurer, Wm. Mansell, and Corresponding-secretary, G. F. Frankland, all of Toronto, Ont.

ON SIZE AND RUNNING STEAM BOILERS.

Editor, Plumber and Steamfitter.—Is it a good thing to have the heating boiler too large on a steam heating job and also when you have boilers "twin-ned" is it better to run the two with very low fires, or run one boiler at full force?

It is a wise thing to have plenty of reserve power in a steam heating boiler, but we are inclined to think that, sometimes a mistake is made in figuring too much capacity. There is little economy in having a boiler so large that you have to run it without the feed doors wide open in order to keep down the steam. When you have two boilers "twin-ned" it has been found in most cases that it is more economical to run one boiler to the extent of its capacity rather than to fire up both boilers and run them easy. It also would require less work upon the part of the janitor.—D. C. H.

REMOVING FOUL AIR FROM THE TOILET ROOM IN FACTORY.

Editor, Plumber and Steamfitter.—In a certain factory that I have in mind the air in the toilet room gets very bad at times and I trust that you can offer some suggestion as to how it can be better ventilated. What are some of the practices in large factories?—Fred H. E.

This is a question that is bothering the people who have to do with matters of this kind and the means taken to cure the evil are many.

Some rooms are installed with special closets that have vents on them that are said to carry off the foul odors. In other cases special vents are put on afterwards that are said to accomplish the result. In other cases the toilet rooms are installed on an outside wall where window ventilation can be had. Even this does not always result satisfactorily as, in the winter time, the windows can be opened for only a short time.

Another way is to fasten the window shut, put a register in the toilet room well up toward the top of the room connecting this register with a stack in which there is maintained a current of air. A panel is taken out of the door of the toilet room and in this manner the air is changed steadily all the time.—D. C. H.

AIR IN THE HOT WATER JOB.

Editor, Plumber and Steamfitter.—Sometimes in certain hot water jobs I notice that the radiators seem to accumulate air. Now just how this air gets in is more than I can figure out. If you have any suggestions to offer, I should be glad to read them.—L. H. B.

If the jobs are open tank systems it may be that the air works in through the water, although we should not care to assume saying so without having looked the work over. Water at atmospheric pressure will absorb something like 4 per cent. of its bulk of air and so you see that there would be a chance for it to get into the system in that manner.

If there are any pipes that are not pitched right there would be another means that would work to the end of the accumulation of air at times.

We should advise you to look the work over very carefully with these suggestions in mind.—D. C. H.

sewage is small and the height it has to be raised is great some type of a piston pump will give good results. In present day practice compressed air ejectors are used many times in this class of work with very satisfactory results.—D. C. H.

VENTING THE SINK TRAP.

Editor, Plumber and Steamfitter.—If it isn't always advisable to vent a sink directly into the stack will you please show the manner in which it may be done?—Apprentice.

In Fig. 4 we show how this may be done. The drawing practically explains

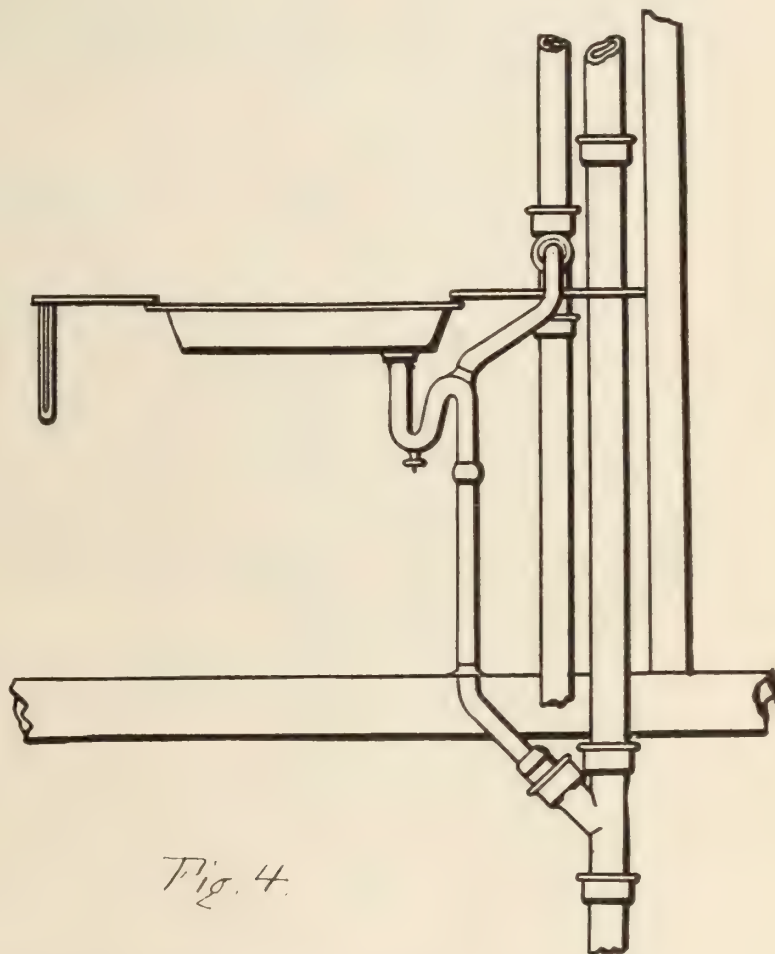


Fig. 4.

RAISING SEWAGE TO STREET SEWER.

Editor, Plumber and Steamfitter.—Will you kindly tell me how they get the sewage into a sewer when the house line is lower than the sewer in the street?—M. J. D.

It is accomplished by using some kind of an ejector. There are several different kinds among which are the following:—When the amount of sewage is great and the height to which it is to be raised is small it is said that a centrifugal pump will give good results.

On the other hand when the amount of

itself, and does not need comment.—D. C. H.

AMOUNT OF GAS EQUAL TO A TON OF COAL.

Editor, Plumber and Steamfitter.—Be kind enough to tell me the amount of gas that would equal, in heating results one ton of coal?—Steamfitter.

If you were to take a fair general average of both coal and gas it has been stated that about 40,000 feet of illuminating gas will equal, in heating power one ton of coal.—D. C. H.

Complete Course in Sheet Metal Work

By L. W. KOSER

Example No. 3 shows how to draw an ellipse by a large and a small circle.

The large circle represents the length of the ellipse, and the small circle represents the width.

Draw the line A-B the desired length, and through the centre—draw the lines C-D the desired width.

With O as centre and O-A as radius describe the large circle. Then with O as centre and O-D as radius describe the small circle.

Begin at A and step the large circle off into any number of equal spaces.

Then begin at S and step the small circle off into the same number of equal spaces. Drop vertical lines from each of

the numbers on the large circle and intersect them by horizontal lines drawn from the corresponding numbers on the small circles. For example, drop vertical lines from 2, 3, and 4 on the small circle. A line traced through the points of intersection completes the ellipse.

Another method of drawing an ellipse is shown by example No. 4, Figs. 1 and 2; the reason that the different radii for describing the different arcs lies within a given plane or boundary.

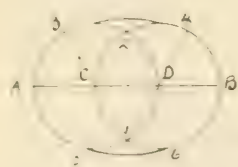
There is one fact, however, that must be kept in mind in regard to this method, and that is, that the length of the ellipse must be one-half times greater than the width; or to put it the other way,

the width must be two-thirds that of the length; this proportion gives a very good ellipse.

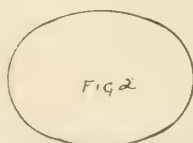
In order to make example No. 4 as plain as possible we show two drawings in developing it, but of course the student can finish it in one.

First draw the line A-B of Fig. 1 the desired length, then through the centre O draw the line C-D two-thirds the length of A-B. The easiest way to get this is to lay off the line A-B in three equal spaces, then lay off one of these on either side of the centre O as O-D and O-C.

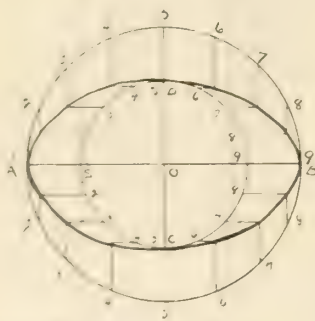
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EXAMPLE #1



EXAMPLE #2



EXAMPLE #3

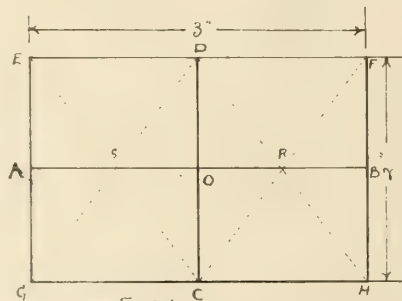


FIG 1

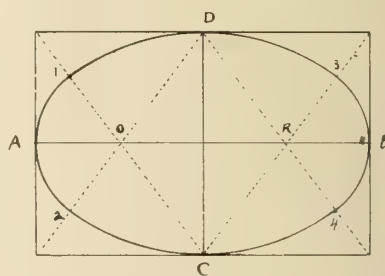
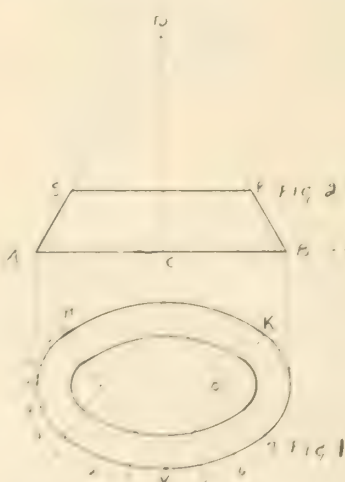


FIG 2

EXAMPLE #4



PROBLEM #31

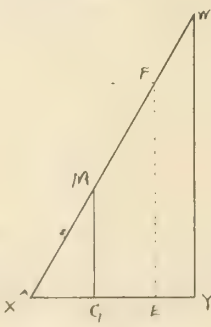
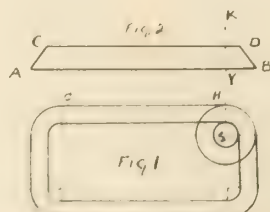


FIG 1



PROBLEM #32

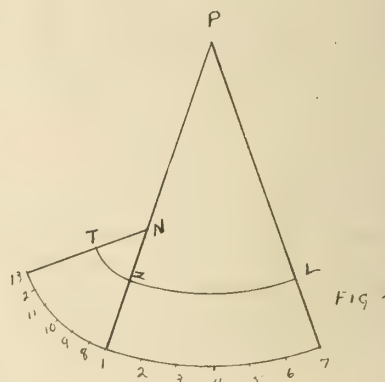


FIG 3

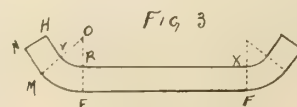


FIG 4

Checking Fire Losses in America

The Loss in the United States and Canada is Much Larger Than in European Countries, Owing to Legislative Laxness and Individual Carelessness—Some Appalling Figures—Methods of Prevention Outlined—Buildings Must be Properly Fireproofed and Windows Protected. .

Why is it that the fire loss in European countries is about 30 cents per head, while in the United States it is \$3, and in Canada \$3.07?

Why is it that Berlin's fire loss is about \$200,000 a year compared to Chicago's \$5,000,000, while Berlin only pays \$300,000 for fire protection and Chicago pays \$2,000,000?

Why does New York pay \$5,000,000 for fire extinction and \$18,000 for fire prevention, when the figures perhaps might be reversed?

These figures are approximately correct and the questions asked become of extreme importance, indicating as they do that there is something radically wrong with conditions in this country and the United States.

What that something is was shown by Franklin H. Wentworth, secretary of the National Fire Protection Association in the course of an address before the Manufacturers' Association at Toronto. Briefly, the excessive loss from fire in America is due to the carelessness and indifference of the people and the faulty methods of prevention arising out of this public apathy. A brief resume of some of the striking points that Mr. Wentworth made will be interesting.

The first inkling of the enormity of America's offence in the matter of fire prevention filtered into men's minds about the time that a number of men got together in Boston to carry on a campaign for the standardization of sprinkling apparatus. Prosecuting their work, they ran into a most amazing labyrinth of difficulties arising out of the fact that there were no standards in the United States for anything. Wires could be put up anywhere or in any fashion. There were no rules governing the proper wiring of buildings, no regulations covering material to be used. Every building was more or less of a fire trap. Appalled at what they had found the members of the association saw that a wide field of activity lay before them—educating the American people to a sense of their danger and unpreparedness.

Mr. Wentworth told in a somewhat humorous vein of the difficulties they experienced. The people were indifferent almost to the point of being callous. Newspapers consigned the matter sent them very promptly to the waste paper basket. Finally, some newspapers have taken up the question and much good

has resulted from the publicity given. Sensible ordinances are now being passed in a number of municipalities and it begins to look as though the immense yearly ravages of the fire fiend would be checked and, perhaps, in time stemmed.

A few facts quoted from Mr. Wentworth's lengthy and graphic address will serve to set forth the situation exactly as it stands to-day. The fire loss in the United States yearly has averaged \$25,000,000 for the last twelve years. Brought down to fractions of time, every minute for the last twelve years has seen the destruction of property valued at \$500. This has been due primarily to the fact that growth has been very rapid and natural resources have been seemingly inexhaustible. In the United States and in Canada, the need of conservation has not been felt and it is only within the last few years that any suggestion of the need has been heard. It is not hard to find whole tracts of land from which the timber has been stripped, left unused

without any attempt being made at reforestation.

A still greater reason has been the almost inexplicable degree to which the carelessness of private individuals has been carried. In Germany, there is one place in the household where matches are kept, and one has to go to that place to get a match. In the American or Canadian household, matches are everywhere—on the kitchen table, on mantles, on dressers, in every old coat or vest in the place. If a man cannot put his hand out anywhere in the dark and find a match, he becomes indignant and disgusted. The result is that rats gnaw them, children play with them and fires are breaking out all the time which can be traced directly to the careless handling of matches.

But this is only one evidence of the average person's carelessness in the matter of fire. Men dump hot coals against board fences, they start bonfires near their neighbors' houses, sometimes—less frequently though—near their own. They send up toy balloons which drip sparks

What it Means to the Sanitary Engineer

THE startling figures presented in the accompanying article demonstrate that the fire loss in the United States and Canada has become a menace of such proportions that steps must be taken at once to check it. Legislation governing the construction and protection of building is sadly needed. Ordinances and materials should be standardized. Most of all, buildings should be constructed with a view to providing the utmost protection against fire.

The situation then has a distinct interest for the sanitary and heating engineer. Buildings must be protected against fire. There are unmistakable signs to show that the country as a whole is awakening to this fact. Prevention must be made the strongest feature, and this is where the matter becomes of supreme importance to the sanitary and heating engineer.

Sprinkling systems are becoming more common especially in factories and large work shops. In large apartment houses fire standpipes with fire hose outlets on each floor are being installed. Other systems also are being more fully developed and all open out a very extensive field for the master plumber. Further developments are continually taking place in systems of electric wiring, installing of gas fixtures and heating. These all, if not properly installed, at once become an aid to fire losses instead of helping to check or prevent them.

Better equipment for buildings is a subject which will be very much to the fore from now on and it will pay the sanitary and heating engineer to keep closely in touch with all developments and thus be prepared to take advantage of all trade openings.

of fire. They seize upon festive occasions as an excuse for introducing all manner of inflammable material into stores and houses. They smoke everywhere—and throw lighted matches around promiscuously and daringly.

Fire has become so common in America that it attracts no attention. In European countries, if a conflagration occurs which creates a loss running up into the hundreds of thousands, there is at once a demand to know how it came about that such a fire could occur, what were the reasons, how the possibility of similar fires should be dealt with, and so on. In America, hundred thousand dollar fires are so common that, if a man picks up a paper which does not contain word of at least two or three, he thinks the day's news dull and uninteresting. Public interest or indignation can be aroused nowadays only by a disastrous holocaust.

All Must Bear the Loss.

The most significant part of it is that the loss is borne by everyone. The tax is indirect but it is there. Manufacturers have to put a margin on the price of their goods to cover the possibility of loss by fire. When a person buys a piece of cotton, the price paid covers fire tribute to the extent of a certain percentage. When Baltimore and San Francisco were wiped out, the loss was not borne by the people of those two cities. Boston and Toronto are still paying for Baltimore and San Francisco; in the future Baltimore and San Francisco may pay for Boston and Toronto.

Statistics prove that the tribute paid per capita each year for fire losses is \$4. If a collector came around on a blue Monday and demanded from the head of a family of five the sum of \$15 to pay the family's share of the fire loss pater familias would be forcibly initiated into a belief of the seriousness of the matter. Nevertheless, every man is paying it just the same, year in and year out.

The Danger of High Buildings.

Biz cities are increasing the danger by the building of skyscrapers. New York is no longer a city—it is a disease. Towering buildings, reaching forty and fifty storeys into the sky, are increasing the fire risk materially. What could be done if fire broke out on the fiftieth storey of one of these skyscrapers? As a fire captain once put it, nothing could be done because firemen were not trained "to fight fire in heaven." This tendency toward high buildings is one of the most dangerous elements in the situation.

And the remedy? There is but one remedy and it is gradually being recognized and applied—Prevention.

The most important phase of measures

of prevention is to have buildings properly equipped against fire. A properly fire-proofed building will serve as a buckler, holding back the advance of even the most vigorous conflagrations and shielding other buildings from the flames.

New York—or any other city—could be made fireproof if the windows in all the buildings were protected. Flames cannot take hold on walls of metal, brick or concrete but they lap through the windows and catch on the woodwork within. A properly constructed building should have metal casings for the windows, standard shutters, metal screens and wire mesh for the windows. Roofs should be fire-proofed. Only by such means is it possible to secure a reasonable degree of immunity from fire. New York has become so thoroughly aroused to her danger that metal shutters are being installed at the rate of 1,000 a week.



PLUMBING MARKETS.

Toronto, Jan. 2.—Both for the sanitary and heating engineer, 1912 has been a record year. In the past, at one time or another throughout the year, a lull in business generally came, but not so during 1912. From first to last, business has been very brisk and few plumbers there were who remained idle at any time through not having had work to do.

Demand for supplies of all kinds both for heating and sanitation has been very heavy and very often jobs have been tied up because supplies could not be obtained. Soil pipe especially has been scarce and during the fall was particularly hard to get. Even now, although conditions are greatly relieved, orders are booked far into 1913. Speaking of soil pipe this week, one local supply man stated "We have orders enough in now to last us well on to September and we have nothing to start with."

For a time, too, lead pipe was scarce but conditions now are very much better in that line. Greater supplies are coming in, and demand is very slack at present. With frosty weather and bursting of pipes demand will again stiffen somewhat.

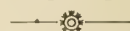
Not only did conditions in the sanitary trade represent prosperity and great activity; the heating trade also was very active. Manufacturers, even with enlarged factories and increased facilities for doing business have had a hard time to keep up with the continuous heavy demand for radiators and boilers. Some styles of radiators have been practically unobtainable at times and boilers, too, have been in much the same conditions.

Soil Pipe.—Prices on soil pipe have

stiffened somewhat of late. Present discounts are 60 and 5 per cent. Pig iron has been advancing so rapidly of late and coke has been not only high in price but also so scarce that higher prices in soil pipe are altogether likely to rule for considerable time to come. Demand is very heavy and mills working to utmost capacity.

Iron Pipe and Fittings.—Fittings are in much the same condition as at last writing. A number of price advances have been made across the line and an early raise is also expected here owing directly to the iron market. Demand for iron pipe is good for season. For the next two or three months, however, little activity is expected in this line.

Enamelware.—Small advances have already been made in enamel ware. Prices on baths have been advanced \$1 and on a few special fixtures an increase of approximately 5 per cent. has been made. There seems little doubt that further advances are pending. Pig iron is steadily increasing; enamel powders have advanced; cost of labor has gone up; and demand during the past year has been greater than ever. So that there is every likelihood that prices in these lines will again go up.



TIPS FOR HELPERS.

(Concluded from page 13.)

ting it up that has been used in running the pipes. It can be put up either before or after the mains are in place.

The points "A, B, C and D" are made with long sweep fittings, and on a small job there will be spring enough to the main to take care of the expansion. I would limit this to mains under 60 feet in length. At "X" a union may be used.



LEAD BURNERS.

Editor Plumber and Steamfitter.—Can you give us the address of a firm manufacturing lead burners? We have a large tank to line in position and cannot turn it on its side. Hamilton & Stott, St. Thomas, Ont.

At present writing we know of only two—The Bailey Farrell Mfg. Co., Pittsburgh, Pa., and Walter MacLeod & Co., Cincinnati, O.



Business Changes Hands.

Hamilton, Ont.—The Chadwick Brass Company have purchased the business of Chadwick Bros., Hamilton, Ont. Additional real estate has been purchased and plans for new buildings which will double the capacity of the plant are now under way. Catalogues are being prepared which will advise the trade fully as to the different styles of goods they are manufacturing

Ventilating System in New Theatre

How Ventilation is Accomplished in "New Theatre," New York City—This Installation is of Very Timely Interest Owing to Great Discussion Regarding Theatre Ventilation.

The New Theatre, New York City, says "Domestic Engineering," is situated on Central Park West and extends from Sixty-second to Sixty-third street. It has a depth on the side streets of 225 feet.

The main structure is seven stories high, the extension occupied mainly by the loft above the stage, being eleven stories.

The orchestra floor is divided into three sections containing about 600 seats. There are twenty-three subscription boxes located above the auditorium level, which contain six seats each. The foyer stalls containing five rows of seats are located above them; and above these stalls is located the first balcony, which has a very large seating capacity. The second balcony contains nine rows of seats. The entire seating capacity of the house is 2,200.

The ventilating apparatus installed provides for tempered fresh air supply for the auditorium, the more important rooms in connection with the auditorium, the stage and the basement buffet rooms; as well as exhaust ventilation for the above mentioned rooms. Exhaust ventilation is also provided for the inside rooms, the kitchen department and the various toilets in the building.

The ventilating apparatus is so arranged that the air supply and exhaust for the auditorium can be reversed. This is accomplished in the following manner.

When the reversing damper is set in its regular position the fresh air supply is conveyed through the reversing apparatus to the air supply registers, and the exhaust air is at the same time passed from the exhaust registers through the reversing apparatus in its transit to the exhaust when the damper is set in the reversed position, the air supply is conveyed to the registers (ordinarily exhaust registers), and the exhaust air drawn from the registers (ordinarily supply registers) and passed through the reversing apparatus in its transit to the exhaust.

The apparatus consists of a reinforced galvanized iron casing with a metal covered swinging damper.

Three Sturtevant steel plate centrifugal fans are installed. One of these fans, which has a blast wheel 12 ft. in diameter by 7 feet wide, furnishes tempered air to the air supply outlets and registers in the auditorium, the foyer, and in the circulations and rooms in connection with the auditorium.

The second fan, having a blast wheel 9 feet in diameter by 4 feet 6 inches wide, provides fresh air to the registers and screens for the stage, stage pit, etc., and with air supply registers in the basement buffet, toilet, etc.

The other fan, which has a blast wheel of 11 feet in diameter by 5 feet 6 inches wide, is employed in exhausting air in connection with the exhaust openings in the orchestra chairs and auditorium, in the foyer, and in the circulations and rooms in connection with the auditorium.

The air discharge shaft from the auditorium exhaust and the vent shaft from the basement are provided with No. 20 gage galvanized iron extensions, which are connected with the tops of the plastered shafts below the roof level, and run up to and connected with the discharge caps.

In addition there is a system of tempered air ducts and flues connecting with the air supply registers in the inside rooms in the stage portion, etc., arranged for connection with an 8-foot blower to be installed at a future date.

The fan wheels have curved blades and are enclosed in full steel-plate housings, designed with inlets, and outlets to meet the space conditions, and are braced to prevent vibration. The parts of the fan housings extending below the floor level are made water-tight.

Two sets of tempering coils are provided in connection with the 12-foot blower for the auditorium. These have an aggregate of 3,450 square feet of heating surface. Each coil is made up of six two-row sections, 12 feet wide by 6 feet high, making the coils 12 rows deep.

A set of tempering coils is also used in connection with the 9-foot blower for the stage, etc. It contains 1,882 square feet of heating surface made up of six two-row sections, 18 feet wide by 8 feet high, making the coil 12 rows deep.

The sections of the tempering coils are made up of 1½ inch pipe screwed into separate cast iron headers on steam and return ends and arranged to secure positive circulation of steam. The headers of each section are six inches wide. The sections are spaced so as to provide ample room for connections and valves.

The inside sections of the tempering coils are controlled by hot air thermostats placed in the tempered air ducts, automatically operating the diaphragm valves on steam and return pipes as re-

quired to maintain the temperature of the air in the ducts at the desired degree.

The two outside sections of the tempering coils are controlled by cold air thermostats located in the fresh air chambers, automatically shutting off the diaphragm valves on steam and return pipes when the incoming air rises to a certain degree, and opening the valves when the outside temperature drops below this degree, thus securing a continuous heating effect from these sections when required.

The tempering coils are encased in jackets of No. 10 gage steel plate. The tempering coil casings extend from the fresh air chamber to the blower inlets. The jackets are made removable and are stiffened and braced to prevent vibration, all ends connected with the brick work, being fitted with angle-iron flanges.

The fresh air inlets in connection with the tempering coils are provided with rolling shutters covering the entire opening and built of No. 18 gage galvanized iron. Each shutter is inclosed in a copper hood.

In addition to the fans already described five disc fans are provided. Two of these fans, which are employed for exhausting air from the stage, are each 54 inches in diameter and are located in the roof space above the stage. Another of these fans is employed for exhausting air from the inside rooms in the stage portion on the north side of the building, the stage pit and basement buffet rooms, etc. It is 54 inches in diameter and is located in the fan room on the sixth story.

The fourth disc fan is employed for exhausting air from the inside rooms in the stage portion on the south side of the building, the stage pit, etc. It is 42 inches in diameter and is located in the fan room on the eleventh story.

The last fan of this series is used to exhaust the air from the kitchen and rooms in connection with the kitchen. It is 54 inches in diameter and is located in the fan room on the eleventh story.

The air discharges from the disc fans, the extension from the auditorium discharge shaft and the extension from the basement vent shaft are capped with protecting hoods made of No. 20 galvanized iron; except the hood for the discharge from the 54-inch exhaust fan

located in the sixth story, which is built of 24-ounce copper.

These fans have No. 20 gage galvanized iron air discharges starting from the fan frame and running up to the proper height.

All of the fans mentioned are run by slow speed electric motors.

All of the ductwork is built of the best bloom galvanized iron of the following sizes:

Ducts and flues having one dimension of 48 inches and over are No. 20 gage, braced with angle iron.

Ducts 30 inches and over, No. 20 gage.

Ducts 12 inches and over, No. 22 gage.

Smaller ducts are No. 24 gage.

Except the exhaust flues and ducts from the kitchen hoods, which are built of No. 14 gage steel plate.

The ducts are provided with slip joints and are suspended by galvanized iron hangers, being braced where required.

The inside radius on all curves on ducts and flues is not less than the width of same. Vertical exhaust and supply flues have full size bends for connection with the horizontal ducts.

A four-inch diameter Sturtevant galvanized iron blast gate of the slide pattern is provided in each individual connection from the orchestra chairs.

Dampers with quadrants indicating their position are provided in branch ducts leading to and from other individual supply and exhaust flues. Dampers are also placed in the main ducts, as are also deflectors and doors where required.

Generally, the top and bottom exhaust registers are respectively near the ceiling and floor.

Fusible dampers are provided in the ducts, made of sheet metal $\frac{1}{8}$ inch thick, set in steel frames hung on eye-bolts from the masonry walls and making air tight connections with the ducts. Each frame has an angle-iron tongue inside of it for receiving the damper and two catches at bottom for locking when closed. The ducts are riveted to steel frames. The spindle of the dampers are located about two-thirds from the bottom of the damper and each damper is held in an open position by two discs of metal, soldered with an alloy, which will melt and release damper at temperature of about 300 degrees F.

The heating and ventilating plans were designed by Carrere & Hastings, architects, New York. The green, Tenny & Olmes, New York, prepared the heating and ventilating plans and specifications.

A COPPER COIL FOR HEATING RANGE BOILER.

Editor, Plumber and Steamfitter.—The other day we had a plumber in the shop tell us that if we made use of a coil made of copper in heating the water for the range boiler that the coil and pipes would never stop up with lime, etc. I wish to ask you if this is a fact for if it is it will save us a lot of trouble many times?—John Ripley.

This plumber who told you the dream about the copper coil is somewhat behind the times. It was the supposition, several years ago that a copper coil would do the thing that he claims for it; but extensive investigation has proved that a copper coil will stop up just about the same as one made from pipe, if anything faster. The proper way to go about avoiding the stopping up of the pipes and coil (or water front) is to use some means to change the water so that it will not have the properties left in it that causes the deposit of the lime, etc., that stops up the pipes.—D.C.H.

HIGH TEMPERATURE CEMENT.

Until within the last few years, fire-clay has been most generally used for laying up brick walls, cementing joints, patching and lining furnaces, kilns and retorts where high temperatures are encountered.

The H. W. Johns-Manville Co., New York, have recently put on the market what they term "J.M. High Temperature Cement No. 31," which it is said can be used practically whenever working temperatures range between 1,500 degs. and 3,100 degs. Fahr. This new material is a dry powder mixture composed of asbestos and other materials of secret preparation. It is mixed with water to the proper consistency for working like mortar or tamping around molds.

When used for setting up fire brick for boilers of furnaces, lining and roofing furnaces of various kinds, lining fire doors and it has considerable mechanical strength. When air dried it will withstand a crushing strain of 883.5 lbs. per square inch. Being semi-acid in character it can be used with chrome bricks, silica bricks or fire-clay bricks.

FELL FROM LADDER.

E. A. Rodgers, of the National Plumbing Supply Co., Toronto, met with a slight accident during the Christmas week by falling from a ladder while stock-taking. Although kept from work for a week, and confined to his bed a great part of that time, no serious injury was done by the fall.

CATALOGUE OF WEIGHTS.

The Tallman Brass & Metal Co., of Hamilton, Ont., have issued a very useful catalogue containing weights, measures, list prices and extras of brass and copper rod, sheet and tubing, tobin bronze rod, etc. Large quantities of this material are kept in stock and in addition to describing these the catalogue also shows what sizes tempers, and gauges are stocked for immediate shipment. In addition, the catalogue also shows the lines of goods this firm manufacture, such as brass, phosphor bronze, copper and aluminum castings. Artie metal, finished brass goods, metal stampings, spinings, nickel plating, etc.

COMPLETE COURSE IN SHEET METAL WORK.

(Continued from page 16.)

Now draw the horizontal lines E-D-F and G-C-H, and the vertical lines E-A-G, and F-B-H.

Draw a line from C to the corners E and F, and from D to the corners G and H.

Where these lines intersect on the line A-B as S and R, will be the centres for drawing the ends of the ellipse, and the points C and D are the centres for drawing the sides.

Now refer to Fig. 2. With the point of the compass placed at S. and with a radius equal to S-A we draw the arc 1-2. In like manner with the point at R we draw the arc 3-4.

Then with C as centre and the radius C-1 we draw the arc or side 1-3, and in like manner with D as centre we draw the arc 2-4, thus completing the ellipse.

In Prob. 31 we show the method of developing the patterns for an elliptical shaped article.

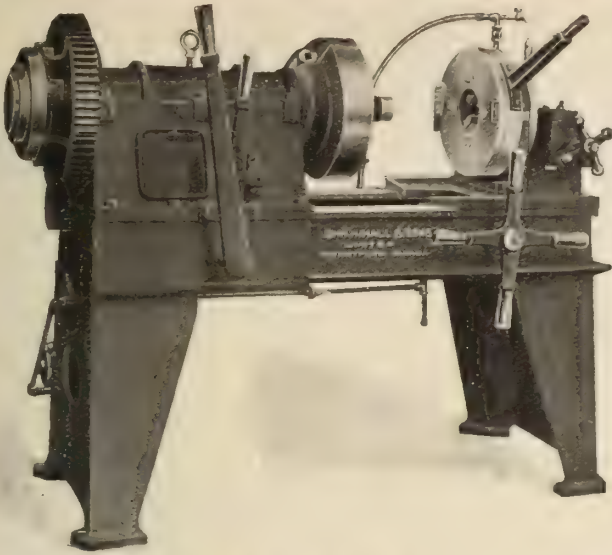
First draw the outside elliptical line by the method shown in example 4. Then the base line A-B of Fig. 2. Then the vertical centre line C-D high enough to give the desired pitch to the sides of the vessel.

Then draw a line from A to D and from B to D.

Draw the line S-R the desired distance above the base line A-B, or the height it is desired to make the vessel.

Then the outline A-B-S-R represents the elevation of the article.

Now in drawing the patterns for an elliptical article by this method, we assume that it is simply two cones of different heights. For instance, the sides having the large curve are considered as two parts of a large cone, and the sides having the small curve are considered as two parts of a small cone.



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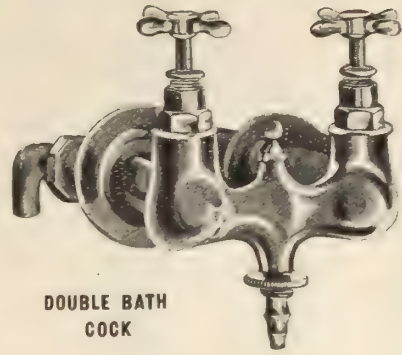
With its connections are easily made, whether pipes are in or out of line. The connection stays tight until deliberately loosened—then the union is as serviceable as when new.

Both Sections of the "Dart" are seated with solid Non-Corroding Bronze, machined and ground to a true ball joint.

Your jobber sells them in all convenient forms.

Any "Dart" proving defective will be replaced 2 for 1.

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COCK

MORRISON'S

J. M. T. Cushion

Compression Work

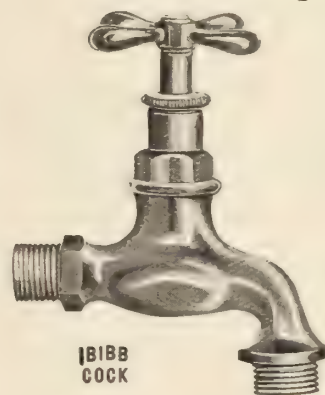
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They have a decided advantage over the ordinary type as they will last for years under ordinary care without the necessity of renewing the washers.

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PRICE TICKETS FOR WINDOW SHOW goods. Black lettering on white card marked 25c, 50c, 75c, \$1, \$1.25, \$1.50, \$1.75, \$2, \$2.50, \$3, \$3.50, \$5. Dozen in set, per set 25 cents postpaid. Technical Book Dept., 143 University Ave., Toronto. (tf)

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WANTED YOUNG OFFICE MAN WITH training in plumbing and heating work. Address: J. E. Farrell, North Bay. (1)

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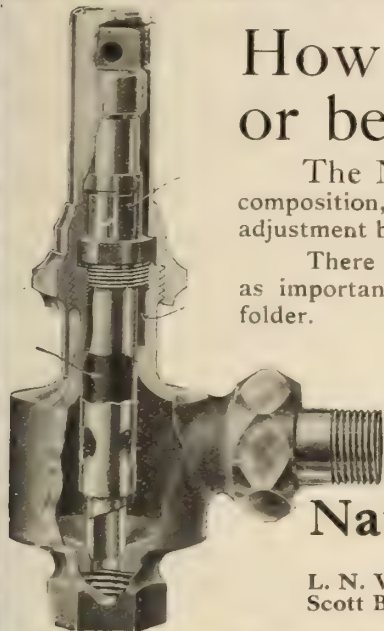
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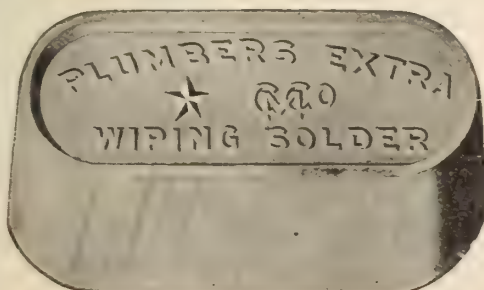
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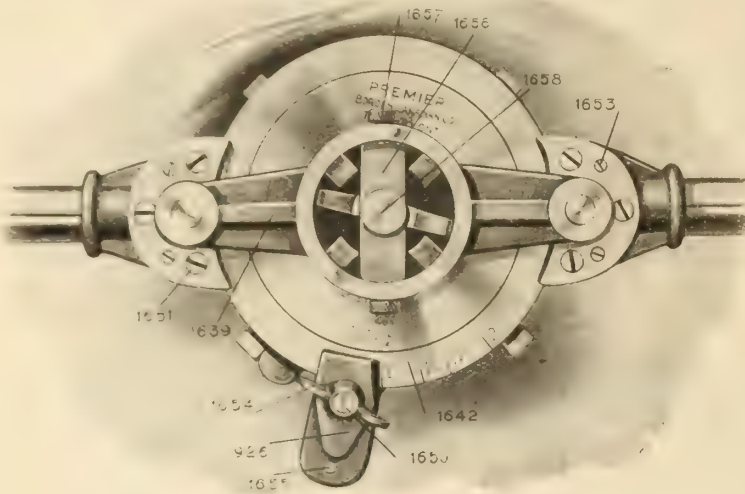
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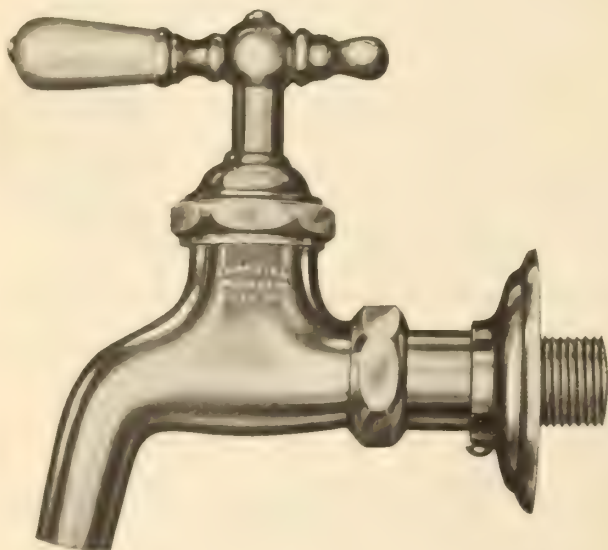


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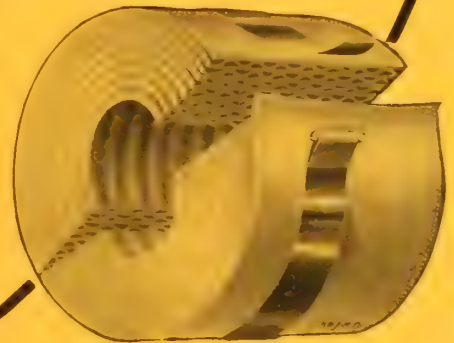
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Vol. VII.

Publication Office : TORONTO, JANUARY 15, 1913

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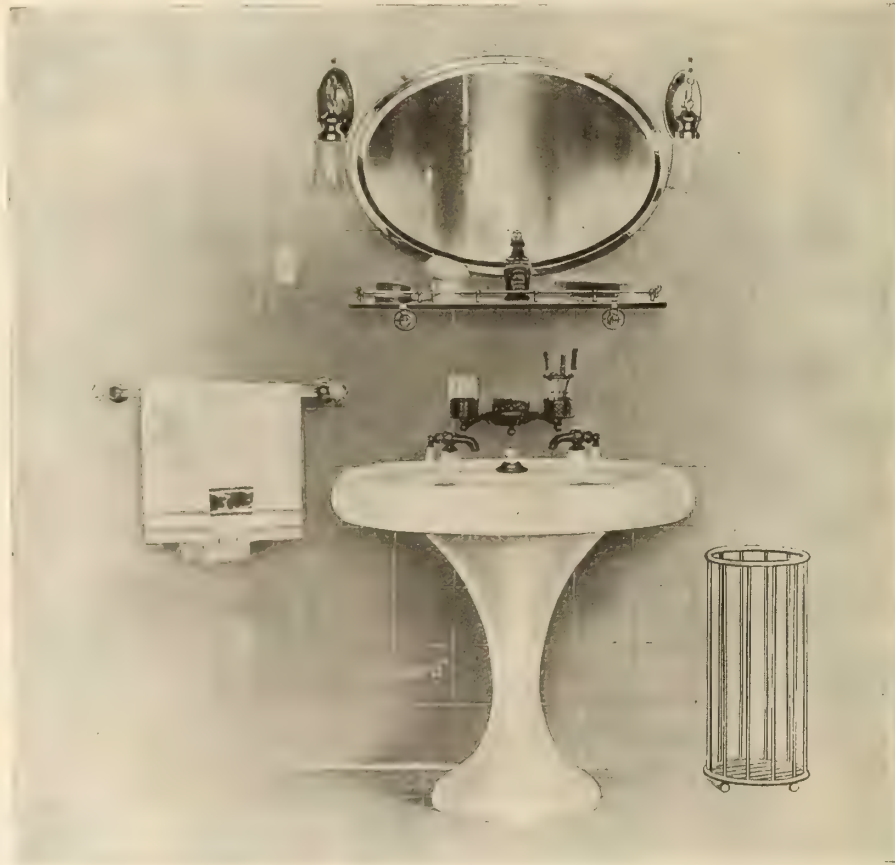


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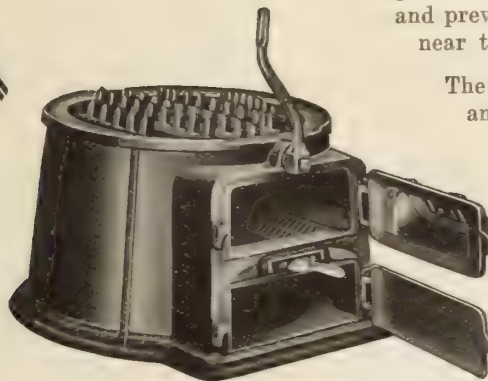
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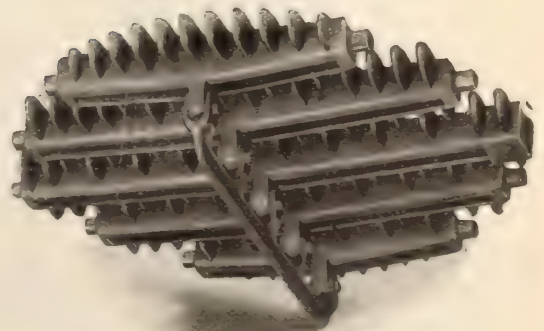
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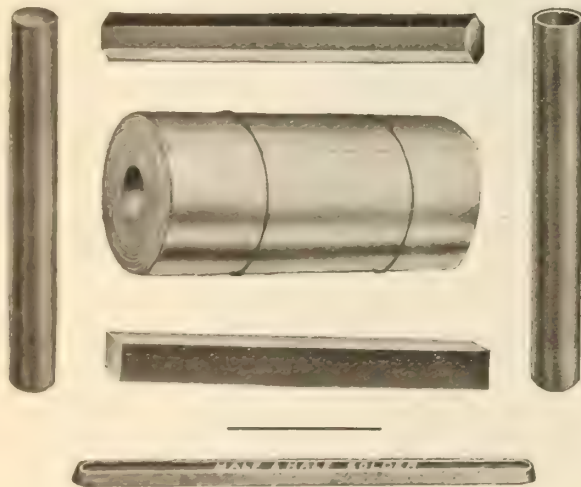
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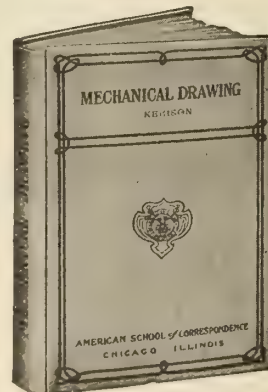


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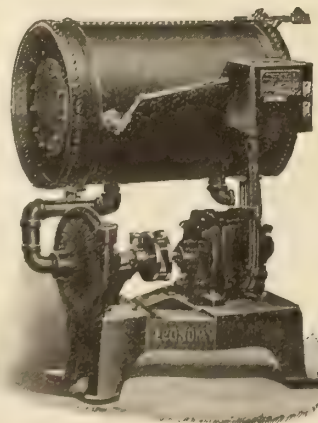
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AND THAT'S WORTH TRYING

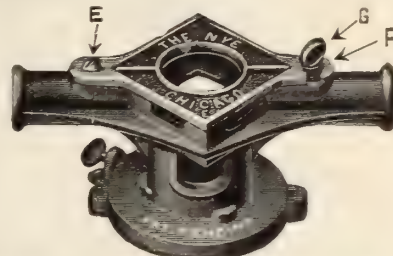
Of course, I know that you won't return the stock, and that you won't hand me a lemon, because I build tools to excel all others, and that's my regular business.

Now, about this stock. It is a complete tool altogether. The parts can't get mislaid, because they hang together like two Irishmen in a German settlement. Every time you want a stock it's there, all intact. It has adjustable bushings, cuts a straight or a crooked thread, and lets the chips slip away

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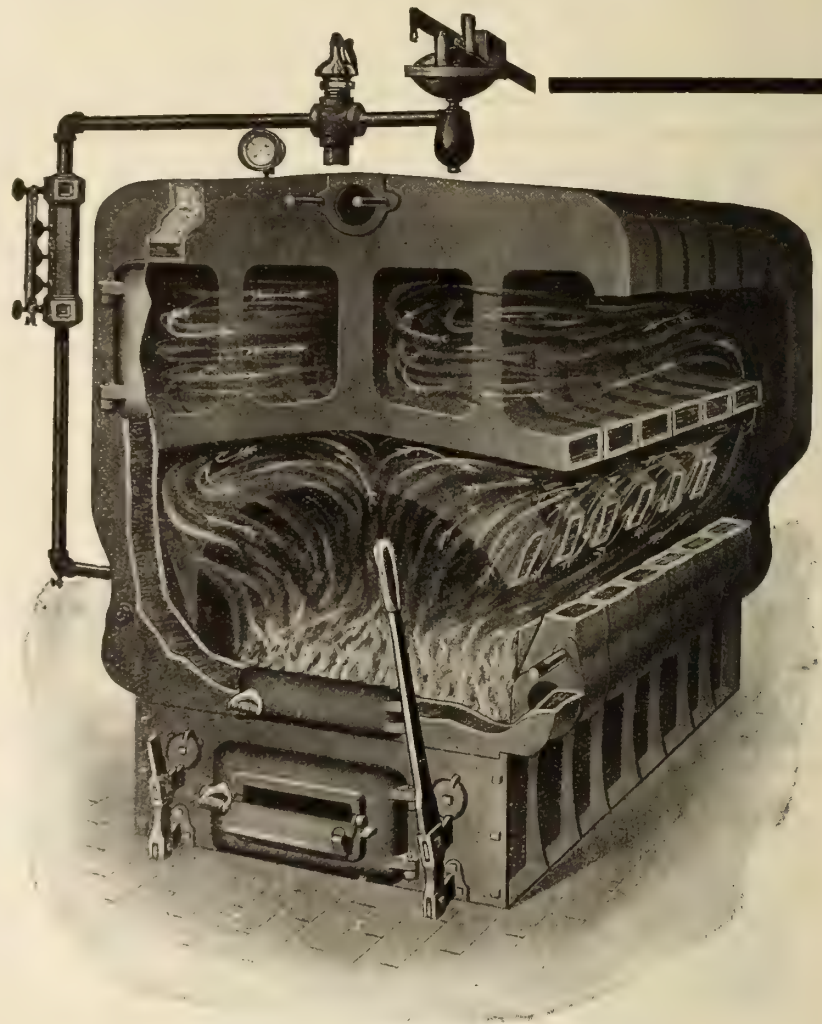
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Movement to Standardize Ordinances

Meeting Will Probably be Held at Winnipeg Shortly to Discuss the Adoption of Standard Regulations for the Prairie Provinces—Idea Originated in Calgary and Has been Most Enthusiastically Received—Eastern Provinces Should Fall into Line.

THE proposal to effect the standardization of all plumbing ordinances throughout the Dominion is at last taking definite form. It has been discussed in a more or less tentative way for some years. In the United States, it has been a live topic for a long time and considerable progress has been made toward the desired end but in Canada the campaign has never, up to the present, at least, passed beyond the suggestive stage.

At the annual convention at the Twin Cities in 1911, the question was discussed at some length and action was very strongly urged. One of the most active advocates of standardization at that time was James Marr, of Calgary, now secretary of the Canadian Society of Domestic Sanitary and Heating Engineers. Mr. Marr has since done a good deal to bring matters to a head and it is due to some extent to his efforts that action now promises.

The movement has been started in Calgary, which, by the way, has been the home of much progressive legislation relating to the sanitary and heating trades. Mr. Fletcher, chief plumbing inspector of the city of Calgary, has been busy for some time past drafting a by-law for the regulation of sanitary appliances in the city. Calgary's growth has been so marked that new regulations have been needed. Before presenting the by-law to the city council for consideration and adoption, Mr. Fletcher thought fit to secure the opinion of the members of the Calgary association.

Several meetings were held and the by-law was carefully gone into, clause by clause. Finally the by-law was approved and in the meantime a very valuable suggestion had been advanced and taken up.

The suggestion was made to Inspector Fletcher that it would be wise to solicit the co-operation of all the plumbing inspectors and medical health officers in the prairie provinces in the planning and adoption of a new set of ordinances which would apply to and govern all places. The fact that conditions are very similar throughout the prairie provinces was urged as a reason why it should be possible to get a by-law which would serve as a standard for all, thus doing away once and for all with the

DATES OF CONVENTION.

The annual meeting of the Ontario Society of Domestic Sanitary and Heating Engineers will be held in Toronto on March 20, 21, and 22. Though it is not expected that business will demand three days, the meeting will be held open during that time to allow of social intercourse between the different members. A full representation from all parts of Ontario is requested. Fuller particulars can freely be had upon application to corresponding secretary, G. F. Frankland.

confliction and confusion which now exists.

Sent Out a Circular.

Acting on this suggestion, Mr. Fletcher sent out a letter to all interested parties, that is to sanitary and heating engineers, inspectors and medical health officers. The following question was asked:

"Are you in favor of a joint meeting of Plumbing Inspectors, Health Officers, and delegates from the National Association of Domestic Sanitary and Heating Engineers, to take into consideration the standardizing of plumbing ordinances for these provinces?"

Idea Was Favored.

The response was both prompt and favorable. Many letters were received, commending the project and promising support. So general was the favor shown that arrangements were at once proceeded with to bring about the suggested meeting.

Negotiations have not yet proceeded far enough to fix the date but arrangements are being hurried forward and the gathering will be held very shortly it is believed.

It is altogether likely that Winnipeg will be fixed upon for the place of meeting and that the arrangements will be conducted under the supervision of the mayor of that city.

It is intended to make the meeting a constructive one. The delegates will attend it with plans of a constructive nature already laid. The standardizing of

ordinances in all the prairie provinces is a big undertaking but there can be no doubt that, if there is the proper representation at the meeting, a movement could be launched which would result in the passing of a standard in a very short time.

To Enlarge the Movement.

The suggestion crops up at once that steps should be taken to make the movement more general, to widen its scope to include all parts of the Dominion. The need for a standardization of ordinances is neither local nor provincial. It is not confined to any one section of the country. Certainly reformation along this line is needed just as much in the east as in the west.

It is probable, therefore, that an invitation will be extended to eastern men to attend the meeting at Winnipeg. If sufficient representation from the east could be secured, the deliberations at Winnipeg would take on a wider significance and would be turned to a consideration of the larger problem of national standard.

If it is impossible to get eastern delegates to attend, however, the next step will be to arrange a meeting at some point in the east. The wisdom of getting the eastern provinces interested and bringing matters to a head as soon after the Winnipeg meeting as possible, will be obvious to all.

Work for the Society.

This is work for the various Sanitary Engineering Societies, Dominion, provincial and local to take up. The committees on legislation should begin at once such work as would result in creating an interest in the matter. Meetings might be held in each province to consider the question.



AS GUESTS OF MAYOR.

The Montreal Master Plumbers' Association is going to Montreal West on the evening of January 24th, as the guests of Mayor Jas. Vallentine and Mrs. Jas. Vallentine. A dance will be given by the host and hostess in the Town Hall. Euchre will be one of the main attractions and a spirited contest is expected as it is reported that the prizes will be very valuable ones. The Plumber and Steamfitter wishes every member a most enjoyable time.

N. B. Society Hold Annual Convention

Members of Society Gather Together in St. John, N.B., and Discuss Business—
Meeting Closed with Banquet—W. J. Crawford the Recipient of Gift on Behalf
of Local Society for Services as Secretary—July Conference To Be Held in
Fredericton.

The annual convention of the New Brunswick Society of Domestic Sanitary, Heating and Plumbing Engineers for 1913 is ended. It was a great success. They convened in Keith's assembly rooms on January 8 and a large number attended the different sessions, which were both interesting and profitable, closing in the evening with a very enjoyable banquet held in the dining hall of the Victoria Hotel on King Street. About forty members of the society were present, including not only representatives from the city, but throughout the province—from Fredericton, Moncton, St. Stephen, Campbellton, Woodstock and other centres. Reports were presented showing the progress made during the year which was most satisfactory; addresses were given by several of the members, and the place of meeting for the July conference was decided to be Fredericton, when the master plumbers will convene on July 8.

The morning session at this meeting was occupied mostly with routine business and the roll-call of members. The proceedings were presided over by the president, George Blake, who made a speech welcoming the visiting delegates, and dwelling upon the success which the society had met with since its organization—also touching briefly upon what was outlined for the coming year. The other officers in addition to Mr. Blake are D. J. Shea, of Fredericton, vice-president, and Peter Campbell, of St. John, secretary. The election of the next board of officers will be held at the meeting to be held in Fredericton in July. It was decided to have representation at the convention of the Dominion body to be held in Montreal, and four delegates were selected to represent the New Brunswick society, namely, G. S. Dorman, of Moncton, D. J. Shea, of Fredericton, George Blake and Peter Campbell, of St. John. It is likely also that a great many of the members will accompany them. Practically all are planning to attend the convention to be held in the local capital.

The banquet held in the evening was a distinctly delightful function. Upwards of forty members attended together with several guests, the chair at the head of the table being occupied by Mr. Blake with H. Dunbrack, the vice-president, having the chair in accordance with his office, opposite the president at the other end of the table. A

tempting and well-varied menu was provided, to which full justice was done, and after everything from soup to nuts had been fully discussed, a round of toasts, speeches, musical and literary numbers was given, much to the enjoyment of all present. The after-dinner speeches were most interesting, particularly those of some of the older members of the association, who spoke of the prosperity it had met with and the worthy objects for which it stood.

On either side of Mr. Blake sat the guests of the evening: Wm. Howard, board of health inspector of plumbing; F. Neil Brodie, architect; Harry J. O'Neill, of James Robertson, Ltd.; W. Campbell, of Taylor, Forbes, Ltd.; H. F. Morrow, of Halifax; Garnett W. Wilson, architect, and the representative of Plumber and Steamfitter. Each of these being toasted either personally or in the toasts to the wholesale houses, or the press, spoke of the general goodwill existing in all connection with the plumbers and congratulating the association on the manner in which it had expanded, and on the success of its convention and banquet. During the evening a telegram was received from Toronto, from John Keefe, of the James Robertson Co., expressing regret at his absence from the banquet but extending his best wishes to the plumbers for another successful year.

Mr. Morrow dealt in an interesting way with the progress of the sister association in Nova Scotia, saying that it had not been quite so prosperous as the New Brunswick body appeared to be, but the prime movers in its welfare had bright hopes for the future. Mr. Brodie and Mr. Wilson were well received in their responses in which they foretold much building expansion for the ensuing year saying that there would be plenty of jobs for the members present to attend to. Building operations in St. John and in fact throughout the province would be carried on on a more extensive scale than heretofore, they said, and it would very likely be a generally prosperous year for the master plumbers.

Mr. O'Neill and Mr. Campbell on behalf of the houses which they represented spoke of their pleasure in being present and of the readiness of their firms to aid the members of the society whenever possible. The best of feeling had prevailed in the past between the wholesale houses and the trade and

there was no reason why there should not be a continuance of the same. On behalf of their houses they wished the society the most successful of years and many more of continued prosperity.

George S. Dorman was heard in response to the toast to the locals, speaking on behalf of Moncton, while D. J. Shea replied with A. R. Farrell on behalf of Fredericton. Mr. Dorman said that matters were progressing very satisfactorily with the Moncton master plumbers and they had experienced a splendid year both in the trade and in their society, to a repetition of which they were eagerly looking forward during 1913. A similar expression of encouragement was cheerfully received from Mr. Farrell from Fredericton and Mr. Shea. The latter spoke at some length, dealing with the changes which had taken place, practically revolutionizing the plumbing trade during the last twenty or thirty years. "Nowadays," he said, "a plumber has not only to be fully up to the mark in this respect but he must likewise be a sanitarian and well conversant with his requirements in this respect. He must know exactly what is best in the interests of the general health and be ready to make the necessary appliances of his trade so as to serve the former well." The government was lending a helping hand and the people were becoming better educated to the work being done by the members of the plumbing fraternity.

During the evening a pleasing feature on the programme was the presentation of a valuable leather traveling bag, with all fittings, to W. J. Crawford, the energetic secretary of the St. John local, who was largely responsible for much of the success due the New Brunswick society. The presentation was made on behalf of the members by Mr. Blake, who expressed hearty and sincere appreciation of the efficient services performed by Mr. Crawford not only with the St. John local but with the provincial body as well. The recipient was greatly surprised at the recognition attesting to his services, but expressed his gratitude at the kindness of the members for their handsome remembrance. He spoke of the early days of the association and told of how it was first projected in the Market building when six of the members of the St. John plumbing fraternity gathered and fostered the idea until the

(Continued on page 9.)

The Plumber as a Retail Merchant

He Should Go into the Sale of Accessories for Bathrooms—Stores Are Now Getting the Trade Which He is Rightly Entitled to—Consideration of a Subject of Deep Moment to the Sanitary Engineer.

THE average master plumber has only too often been slow in realizing that there are open before him great possibilities as a retail merchant. When a plumber installs a bathroom, he leaves it at best in a very incomplete shape and the man who owns the house has to go around to half a dozen different places to get the desired articles to finish fitting up the bathroom.

When a man buys an automobile he does not expect to have to go to some large dry goods store or department store for a rug, to a hardware store for a lamp, to a drug store for gasoline, or to a furniture store for a chest or case in which to keep his tools. He finds all that is necessary both for his comfort and his safety in the one place. The same is true of the man who goes to buy a player piano. He secures a selection of music rolls from the man who sold him the player-piano. These are two very common instances, but each of the above-mentioned articles is no more incomplete without its accessories than the modern bathroom when the plumber leaves it.

The average plumber will arrange a very attractive display room and take great care to show up his line of plumbing and heating goods to the very best of his ability, but he seldom thinks of keeping in stock the many fixtures in enamel, glass or nickel upon which depends very largely the comfort of the room in a house.

After having arranged his attractive display of plumbing and heating goods, the plumber lies in wait for his customer. The display may readily attract the prospective buyer within the walls of the store; after that it becomes the duty of the plumber to talk him into making a purchase. If he is unable to do this, his time and energies are practically wasted for he has nothing upon which he may fall back, but if successful he is amply repaid for his labors. On the other hand, if he carries a complete line of fixtures he not only has them to fall back on if he is unable to make a larger sale, but also advertises his business through them and is able to build up quite a little retail trade.

Fixtures of this sort are numerous and a list of considerable length may be struck off on the spur of the moment. A few may here be mentioned: mirrors, holders for tooth brushes, holder for the

tumbler, racks for the towels, a receptacle for the soap and sponges, plate glass shelves and the necessary brackets, powders and preparations of various natures for scouring and cleaning, bath mats, curtains for enclosing sprays, small gas heaters, brushes of all kinds, and even toilet paper, sanitary paper towels and waste paper baskets to receive same—and so on.

Here is a source of profitable business of which few of the plumbers are taking advantage. Such articles do not require a very great amount of room, and few there are who already do not possess facilities for stocking and displaying such lines. The average man will spend at least \$10 for even a meagre equipment of these accessories, and if quality is sought, it becomes a very simple matter to run up a bill of \$40 or \$50, or even more. The men who now are enjoying the profits on these amounts are the hardware dealers, dry goods merchants, druggists and others, whereas the plumber is the man who rightfully comes first and who, in reality, has the best opportunity of all. If only he is willing to put forth a little extra energy, and exercise a little salesmanship he can easily secure these profits before his customers have begun to think about going around to all the other stores in search of the numerous articles they desire.

Notice the way the dry goods merchant goes about making sales. He advertises his goods, and gets people into the habit of coming to his store. Once in, it becomes the duty of the sales-clerks to make a sale whether the customer came in with the idea of purchasing or simply with the intention of looking over a few of the goods. The public should be brought to regard the plumber's shop as the proper place to look for bathroom fixtures just the same as the dry goods merchant has educated people to come in and look around for dress goods, novelties, ready-made clothing, etc.

The methods adopted by the plumber in going after business of this nature depends entirely upon the class of customer for whom the plumbing is being installed. Also, whether the fixtures are to be used simply for finishing up a job for which the plumber has the contract or for building up an independent busi-

ness will count for much in the way a plumber meets his customer.

The idea of the complete appearance presented and the extra comfort to the owners should become a strong talking point and be very useful in making sales.

Where people already have bathrooms installed, novelties can be made the chief talking point. New fixtures of various descriptions are continually being introduced and many possess such invaluable qualities that they are readily introduced into private homes. These goods not only sell to people who call to look over plumbing and heating fixtures but bring a regular run of buyers who are looking for specialties and labor-saving devices. Thus, indirectly, attention is drawn to the larger plumbing and heating goods. Carrying the idea even farther, power machines such as vacuum cleaners, power washing machines, and water motor fans, may readily be introduced. There is no reason why the master plumber should not stock and sell these lines also.



N.B. SOCIETY HOLD ANNUAL CONVENTION.

(Concluded from page 8.)

local grew in numbers, and its good health encouraged the formation of the larger body, embracing the locals in different parts of the province. Mr. Crawford assured the members that it was a pleasure for him to render any service possible in this connection, and said that he would be at all times most willing to exert himself in the interests of the society.

An enjoyable programme of songs and music was given, each number being warmly received. Piccolo selections were given by Jafes Myers, a solo by F. S. Walker entitled "Comin' Thro' the Rye with Jennie," a duet entitled "If He's Bald 'tis Not His Fault" by Messrs. Nobles and Codner, and a round of choruses and songs by all present, closing with the singing of "Auld Lang Syne" in the "wee sma' hours o' the moornin'.



MOVED TO AILSA CRAIG.

W. D. Yelf, sanitary and heating engineer, recently of Caledonia, Ont., has moved to Ailsa Craig, Ont., where he will carry on business in the old stand of J. E. Westcott & Co.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto Atabek, London, Eng.

JOHN BAYNE MACLEAN, - President

J. G. LORRIMAN, - - - Manager

T. B. COSTAIN

W. S. FARQUHARSON } Editors

Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, JANUARY 15, 1913

Important Movement Started

THE LEADING article in this issue deals with a question of deep import to the trade. It has long been recognized that one of the prime necessities of the country is a set of standard ordinances governing sanitary installations. This has been very generally recognized and very generally discussed, but so far little has been done to effect the much needed reform.

It is with great pleasure, therefore, that one learns of the movement now under foot to assemble at Winnipeg the men capable of planning and putting into effect a set of standard ordinances for the prairie provinces—the sanitary engineers, medical health officers and the sanitary inspectors. That action, speedy and decisive, will follow this meeting seems reasonably assured.

As has often been stated, this question is not in the least sense sectional. It is a national problem. It affects all sections alike. Therefore, the action of the Western men should be closely followed in the East. Standardization is a necessity in all parts of the country and the adoption of a set of common ordinances for the prairie provinces is not going to improve matters in the East, except that the good example may have a stimulating effect. It will be necessary for the leading men in the trade to grapple with this problem and the sooner that the good work is started, the better.



Standard Prices Needed

If we have no conception whatever of wherein a thing is valuable, it is of no practical benefit to us. Or if we only imagine a thing is valuable and find that in reality it has proved very detrimental both to ourselves and to our business interests the thing is worse than useless. There

is little use of going into anything which is not of some benefit to us directly or indirectly, or in staying with a proposition which we find unsatisfactory and injurious.

And what is true of the individual is true of the association. The man who sees what schemes, if introduced, will be of value to him is the man who is going to make a success of his business. And the association which works together for the benefit of its members is the association which will hold together and accomplish great things.

There are matters which can be accomplished through the association which could never be attained by the individual, but which will be of direct value to every individual member. Of these, the one most directly beneath our eyes at the present time is the standardization of prices. While no one man could effect such a situation, an association working together removes all obstacles and makes the victory comparatively easy.

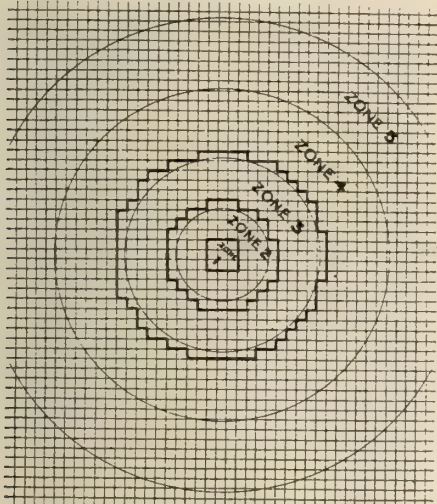
That standard prices are bound to come seems certain and the sooner that associations awaken up to the realization of this, and get busy at introducing them, the better for all concerned. That such a condition would prove beneficial not only to the trade as a whole, but to each member as an individual also is a matter regarding which there is little doubt. The abominable and ruinous system of price-cutting would at once be eliminated; the practice of trying to beat down the plumber's prices at present adopted by so many private individuals would soon be abandoned, for, in a very short time such people would realize that no matter where they went the price would be the same, and a more fair value, fair both to the trade and the consumer, would be given for money demanded. This is something which is bound to come, whether sooner or later, and we would like to hear of action being taken in this direction.

The Operation of Parcels Post Measure

Movement Now Under Way to Introduce Measure in Canada—Sanitary Engineers Must Prepare to Fight and Also to Meet Conditions Should the Measure Carry—The System Now Being Put into Effect in the United States.

SANITARY engineers have felt already the pinch of departmental store and mail order opposition. People buy goods from the stores which they formerly secured from the plumber. This is the case more particularly in the larger cities, but it is spreading and the establishment of a Parcels Post would go a long way to expedite the growth of the practice.

It is becoming increasingly apparent that parcels post is a possibility in Canada for the not far-distant future. The Postmaster-General has publicly stated his intention of investigating the working of the Bourne Act in the United States with a view to framing a measure for this country. The possibility of a similar measure becoming law in Canada depends upon two things; first, the success of the Bourne Act in the United States; second, the effectiveness of the opposition brought to bear here.



How the zone system will work out.

The retailers, as a body, can be counted upon to fight the introduction of a parcels Post measure tooth and nail. If this opposition is properly organized and is brought to bear soon enough, it should be sufficient to effectually baulk the proposal to put the measure through. The fact remains, however, that the forces behind the proposal seem to have the upper hand at present and that the retailer must make his opposition felt at once if it is to be effective.

A wise general considers all contingencies and prepares himself to meet them. The retailer should not only prepare to fight the measure to the last ditch but should also cast around to find the means to meet conditions, should

the Act ultimately be put into force. There is no use shirking the issue. It must be faced; and the sooner the retailer prepares to face it, the stronger he will be when the necessity for action arises.

Developments in the United States will be watched very closely under the circumstances. The success or the failure of the Bourne Act will have much to do with the outcome in this country. It will be interesting to see just how this much discussed measure proposes to go about the establishment of parcels post in Uncle Sam's land.

Details of the Plan.

The Bourne Act provides that fourth-class mail matter will include all parcels, farm and dairy products, provided that such packages are not more than eleven pounds in weight or more than seventy-two inches in length and girth combined. Charges will be based on both weight and distance. To determine distance, the country is to be divided into units of area, each thirty minutes square. The service will be rendered by zones. There will be eight zones in all, with different charge scales for each.

The first zone will be all of the territory within one unit of area and the territory in other units which border on the central unit. Figured out, this means that the first zone for any given post office is approximately fifty miles in any direction.

The zone system is described in Railroad Man's Magazine by C. H. Claudy, in the following terms:

The first zone is thus quadrangular but not square in shape, since it is bounded on east and west by meridians

of longitude which, of course, converge as they go north and diverge as they go south. All other zones are roughly circular in shape. Zone two includes all units of area outside zone one which lie either wholly or in part within a circle drawn from the centre of a given unit of area, the circle to have a radius of 150 miles.

The third zone includes all the territory outside of zone two, within the radius of a circle of 300 miles, and with the same proviso that all units of area through which its boundary circle passes are a part of that zone. The fourth zone has a radius of 600 miles, the fifth zone a radius of 1,000 miles, the sixth zone a radius of 1,400 miles, the seventh zone a radius of 1,800 miles, and the eighth zone includes all units of area outside of zone seven.

The rates will be as follows:

For delivery in zone one: 5 cents for the first pound, 3 cent for each additional pound or fraction.

For delivery in zone two: 6 cents for the first pound, 4 cents for each additional pound or fraction.

For delivery in zone three: 7 cents for the first pound, 5 cents for each additional pound or fraction.

For delivery in zone four: 8 cents for the first pound, 6 cents for each additional pound or fraction.

For delivery in zone five: 9 cents for the first pound, 7 cents for each additional pound or fraction.

For delivery in zone six: 10 cents for the first pound, 9 cents for each additional pound or fraction.

For delivery in zone seven: 11 cents for the first pound, 10 cents for each additional pound or fraction.



The operation of Parcels Post as seen by Railroad Man's Magazine. The cartoonist sees great possibilities in the measure.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

HEATING ANOTHER ROOM FROM THE RANGE BOILER.

Editor Plumber and Steamfitter.—Will you please show how a small bed room can be heated by a coil or radiator from a range boiler

P. G.

In Fig. 1 we show just how this may be done. Several jobs like this have

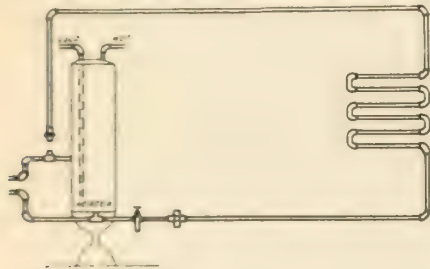


Fig. 1.

been installed, and they all worked well.
D.C.H.

LOCATING AND SETTING THE SINK.

Editor Plumber and Steamfitter.—Will you give me the proper height at which to set the kitchen sink? Also where in the room it should be set?

J. Gillette.

The rule which most people observe for setting a sink for height is all to the bad and we shall not state it here. We believe that the height should be adjusted to the convenience of the owner and, as a rule, nine out of every ten sinks are set far too low. It is a back-breaking task for the housewife to stoop at the sink many times each day when a little foresight on the part of the plumber might have done away with all this needless pain. Instead of setting all sinks for all persons at the same height, there should be a variation of as much as eight or ten inches according to the physical make-up of the person who will have to use the sink the most. A sink should never be placed in the dark corner of the room. It should be placed close to a window

where light and air can get to it.—D. C.H.

HOW MUCH HEATING SURFACE ON A RANGE BOILER?

Editor Plumber and Steamfitter.—I wish to set a range boiler in a back bed-room to heat it, and would like to know if you will tell me how many square feet of heating surface there would be on a boiler five feet high and thirteen inches in diameter? Also how do you get at it?

As we figure it there would be on a range boiler of the size you mention about eighteen and three-quarter square feet of heating surface. Diameter of boiler x 3.1416 gives 40,481. Multiply same by 60" (5 ft) gives 2,450 square in. Dividing this product by 144, gives 17 sq. ft. of heating surface. There are then left the top and bottom of some 260 sq. inches.—D.C.H.

HOT WATER JOB DOESN'T HEAT.

Editor Plumber and Steamfitter.—I am sending you a sketch of a hot water job that doesn't heat as it should. Please tell me why.
C.C.C.



Fig. 2.

It is probably air bound at point we mark "A." Also the inch and a quarter pipe between house and tank is dipped the wrong way.—D.C.H.

KEEPING UP STEAM.

Editor Plumber and Steamfitter.—One of my customers complains a good deal about the frequency that he has to fire the boiler in his house to keep the steam up. It will heat the house all O. K., but must be fired about every four

hours. I would like to have your idea on the subject.

John G. Hains.

There are a great many things that might be suggested. The job may be overloaded with radiation or the mains not covered or the house very poorly constructed, but probably the most liable reason is that your customer does not

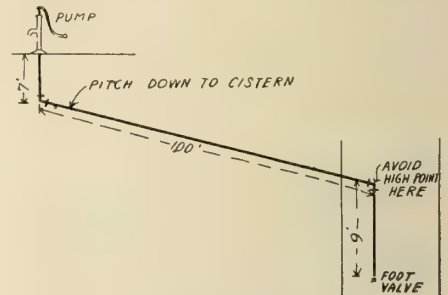


Fig. 3.

know how to fire a house heating boiler, and thinks he is running a locomotive. Go to the house and observe just how he runs the job. Try to get the party into the idea of running a deep fire that is banked instead of trying to force the boiler and we believe that you will have done away with the main reason in this case.—D.C.H.

MAKING A PUMP WORK FOR A LONG DISTANCE.

Editor Plumber and Steamfitter.—I have a pump that is located a distance of about 100 feet from the cistern and it does not get the best of results. Should the pipe be larger than one inch in size I enclose a sketch. Please answer in next issue.

Samuel Gay.

Pipe one and one-quarter in size would undoubtedly be better. We have marked the main points on the sketch you sent and in addition would suggest that you be perfectly sure that there are no cracks or sand holes in the fittings and that the pipe is not split, also that there are no leaks where the treads are made up. With these suggestions and the sketch you ought to come out all

right. Examine Fig. 3 carefully and go ahead.—D.C.H.

RANGE BOILER SIZES.

Editor Plumber and Steamfitter.—Will you kindly give me the measurements of some of the more common sizes of range boilers that are for kitchen use? Apprentice.

The range boilers generally used in kitchens vary in size—the more common holding from 30 to 60 gallons. We give the sizes up to and including 100 gallons.

30 gallons	5 ft. x 12 in.
40 gallons	5 ft. x 14 in.
52 gallons	5 ft. x 16 in.
66 gallons	5 ft. x 18 in.
82 gallons	5 ft. x 20 in.
100 gallons.....	5 ft. x 22 in.

Different manufacturers may have boilers of different dimensions from those given which we do not quote as standard.—D.C.H.

WHY THE LEAK STOPS.

Editor Plumber and Steamfitter.—I have frequently stopped bad leaks in steam boilers by using either Indian meal, oat meal or on a pinch horse manure. Just why this succeeds I am unable to say and am writing you to find the cause. X X.

We do not remember as to ever having seen the solution of this question, although we have turned the trick ourselves in our journeyman's days. Probably it comes from the materials being drawn into the opening, which becomes, in time, stopped up and the reason might be that some of the materials might cause rust which would stop up the leak. If any one can explain this better we should be glad to publish the same.—D.C.H.

FIGURING THE "EXTRAS."

Editor Plumber and Steamfitter.—In almost every heating or plumbing estimate there appears an item headed "extras," or perhaps "incidentals." How would you figure this item?

Query.

This is a question upon which there is some difference of opinion. Some just lump it off according to the size of the job,—a very uncertain proposition. On very small jobs we believe that it might be done by the hour. On larger jobs a certain per cent. might be taken (a year's experience will show about what this per cent. should be). By the percentage method uniformity will be secured, and what might be lost on one job will be made up on another. Owing

to such items as breakage no certainty can be assured and we believe that the percentage method comes the nearest to meeting the difficulty at present.—D.C.H.

HOTEL TOILET ROOM.

Editor Plumber and Steamfitter.—Having to bid on a toilet room for a modern hotel, I wish that you would publish an illustration in an early issue so that I could get an idea of some up-to-date lay out.



Fig. 4.

In Fig. 4 the subscriber will observe an exceedingly good lay out of an installation that has given very satisfactory results.—D.C.H.

ABATING NUISANCES.

Editor Plumber and Steamfitter.—What can be done to, for or against the people who are always and forever throwing tobacco in the urinals of public places? I wish that you would make some suggestions. A. B.

There are screens of certain patterns which partially accomplish the purpose but in some public places where the care taker is irregular in attendance it is a difficult matter to regulate. If cuspidors and waste paper baskets are provided we think the difficulties would be reduced some. Also if the attendant be quite muscular and not afraid to enforce the regulations it would help a good deal.—D.C.H.

PACIFYING CRANKY OWNERS.

Editor Plumber and Steamfitter.—I have got a lot of cranky customers who kick like everything every time a little bill is sent to them and many times they refuse to pay for the packing of the faucets or radiator valves. How can I get back at them? G.S.M.

Your expression, "getting back at them," shows that you are not the easiest kind of man to deal with. Cease to hold the idea that you must do something to "get even," and try to figure

out some way to get a square deal for both your customer and yourself. You know that you would object to paying \$2 for about 2 cents worth of work and materials, yet this is what happens many times in our business and there is no getting around it. A very good manner of getting around these "jobbing" difficulties and one that has worked out satisfactorily in many places is to make a contract to keep the plumbing and heating in repair for a year's time for a certain amount of money. Equitable clauses can be inserted in the contract regarding unusual damages and breakages. In this manner the owner will feel very much safer and you will find that the settlement will be very much easier and the kicking reduced to a minimum.—D.C.H.

WHY DID THE STACK FREEZE?

Editor Plumber and Steamfitter.—You will find enclosed sketch of soil pipe stock on a certain job we installed a year ago. On account of bath room downstairs we had to run stack as shown. Now last year the pipe never showed any sign of freezing. This year it froze at point shown by arrow. Cold and hot water pipes running right alongside showed no sign of frost. Can you explain this? We haven't had any really cold weather yet. The water closet valve was running a little all the time. Could that have anything to do with it? A.F.P., Toronto.

You are evidently on the right track when you speak of the leaking valve. Your pipe between floor and ceiling has not very much fall in it, according to your sketch, and being a year older now may have a good deal of sediment in it

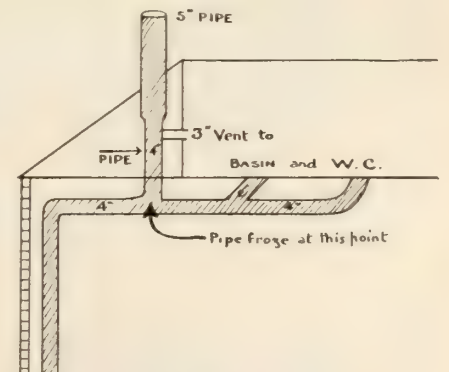


Fig. 5.

which would impede the flow from the leaky valve. At the point where your pipe froze it was very much exposed to the cold air coming down the stack. If you fix the valve in your tank we think you will have no further trouble.—D. C. H.

The Abuse of Heating Apparatus

DON REX writes in the Plumbers' Trade Journal as follows:—

What heating contractor or steamfitter in the course of his business life has not been asked again and again the questions: "What is the ordinary life of a steam heating apparatus?" "What is the ordinary life of a hot water system?" and again, "How long will such a boiler (meaning a cast iron heater) last?" Many tradesmen engaged in the business of installing steam and hot water heating apparatus are competent to answer inquiries of this nature and show their knowledge of the subject by replying in such a manner as to satisfy their prospective customers. However, the fact remains that quite a large number of fitters are not sufficiently well informed to give an intelligent and emphatic answer to such important questions.

We may say that, as a rule, the carelessness and cautiousness of the owner and the character of the attention given the apparatus by him have much to do with the length of life of it. Having completed the installation the heating contractor places the job in the hands of his customer, frequently without giving him sufficient explanation or instruction regarding its proper operation or the

through ignorance of the proper method of attending it.

Basing our conclusions on the supposition that heating materials of standard weight and quality have been used in the installation of the work, there are two factors which govern the longevity of the plant, and these are (1) proper care and (2) abuse.

The abuse to which heating apparatus is subjected may be the result of carelessness or of ignorance, or as usually found, a little of each—conditions which should not prevail or occur and which probably would not had the owner or attendant a correct understanding of the apparatus. Having completed his work the contractor or steamfitter should secure an appointment with the owner at which time beginning at the heater, he should explain in detail the operation of the job and impress upon him what care is necessary in the way of attendance to manage it properly.

Starting at the boiler or heater, explain its construction and show how to clean it, impressing upon the owner the advisability of thoroughly cleaning the heating surfaces at least once each month. Soot is an excellent non-conductor and heating surfaces covered with an accumulation of it cannot be sensitive, thereby requiring a hotter fire and consequently more fuel to produce the desired effects.

A homely illustration can be derived from the cast iron boiling kettle. The bottom of such a receptacle may be so overspread with soot that when placed empty on the fire of the kitchen range, a person may hold his or her hand against the inside of the bottom for a considerable length of time without danger of burning the flesh. Remove the soot and try the same experiment again, when the difference will be quickly noticeable and felt.

Each pound of anthracite coal contains approximately 14,500 heat units and the heater which will utilize the largest portion of this quantity of heat units is the most economical to use; therefore, keep the heating surfaces of the boiler free of all dirt to insure the best results.

Two parts of a steam heating plant, when misused, are sources of annoyance and expense, and aside from the boiler they are the only ones liable to get out of order. We refer to radiator valves and air valves. The abuse of valves alone is responsible for much of the trouble experienced with them and to this cause is due the annoyance resulting from the chug-chugging or water hammer in the radiators and piping of a steam heating apparatus. A radiator

valve when not closed tightly will allow the radiator to fill with steam, but so slowly that it condenses as soon as the supply enters, the operation gradually filling the radiator with water.

Fig. 1 illustrates this action and its result. When the valve is opened wide and the flow of steam turned into the radiator it will produce such a period

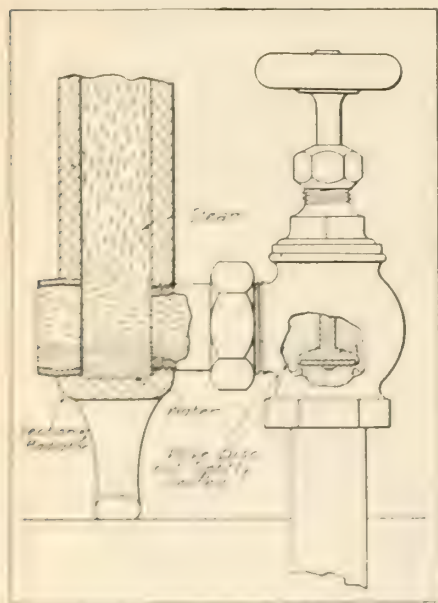


Fig. 1.—Valve not closed tightly, allowing radiator to fill with steam and later with water.

best method of caring for the apparatus. The result is that quite often the system is claimed to be an unsatisfactory job, or accidents occur which might easily have been prevented. Again, the life of the apparatus turned over in this manner is shortened by the abuse it receives

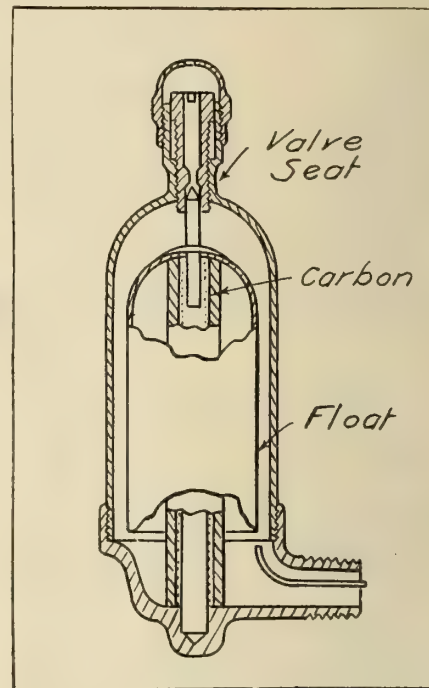


Fig. 2.—Float automatic air valve.

of snapping and snorting that one would think it was trying to break loose from the connection. In closing a steam radiator valve the wheel should be turned until the disc is against the inner seat, when it should be set tight by a further slight hard movement.

Such a noise as referred to is not always due, however, to a failure on the part of the attendant to properly close the valve. The cause of the trouble may arise from some carelessness exhibited by the fitter when installing the job. When you observe the worker stand a length of pipe on end and pound it with a hammer before putting the piece in place you may safely count him a careful and painstaking mechanic.

Pipe shipped back and forth between mill, jobber and fitter, and then handled by the latter, is bound to pick up dirt, which will at some time, unless removed by the simple action above mentioned, collect on the seat of a valve and prevent the disc from closing tightly. Often a bit of such foreign substance or scale will spring the valve seat when the disc is forced down, thus ruining the valve. One of the arguments ad-

vanced in favor of the usage of vacuum or vacuum vapor system is that freedom is obtained from this trouble with valves, the condensation in such a system being automatically removed from the radiator before it can collect in any dangerous quantity.

Screwing valves on imperfect or half cut threads, a poor alignment of the valve with the radiator when the connection is made, straining due to the exertion of too much force or to the use of too large a wrench—any one of which may ruin the valve, are faults common to those fitters who work on the principle that a shell of soft steam metal will withstand the same abuse and strain as will a piece of wrought iron or steel pipe.

Air valve troubles — and they are many—are chiefly the result of too frequent adjustments, or as someone has aptly said, "too much screw-driver." The ordinary type of the float automatic air valve has a brass plug which screws into the neck of the valve. A small hole through this plug, countersunk on the under side, forms the valve-seat (see Fig. 2), and into it the pin of the float engages, the valve being adjusted by unscrewing the plug or screwing it farther down into the valve. The continual use of a screw-driver in an effort to adjust the valve will damage it sufficiently to render it worthless. When once properly arranged they should be left undisturbed until possibly such time as the valves become clogged with dirt, when it becomes necessary, of course, to clean and readjust them.

If you are placing such valves on your work and your customer claims they are of no value, readjust them, after which, as a rule, suggest to the owner that he throw away his screw-driver, when he will experience no further trouble. This tendency to fool or play with such intricate parts of an apparatus as may be within easy reach has led to the adoption of special forms of automatic air valves, particularly for use on radiators in schools and hotels. Here again the

vacuum or vacuum-vapor system affords a relief from the trouble, as either one discards the air valves, making no use of this type whatever.

To recur to the question mentioned at the outset of this article you may safely advise your customer that barring accident, a hot water heating apparatus with a cast iron heater, which is assembled with push or screw nipple joints, is practically indestructible; that the average life of a low-pressure steam heating apparatus under the same conditions would be from twenty-five to thirty years; and that a cast iron heater so constructed is of almost everlasting durability. We might add that circumstances can prevail under which the nipples, or those parts of them which are exposed to the sulphur or gases from the fire, might be eaten through by corrosion, in which case, of course, it would be necessary to renew them after a term of years.

In our discussion thus far we have purposely refrained from including any reference to the warping and burning out of grates or grate bars, considering this a particular abuse in a class by itself. Only a few days ago, on a job where the apparatus was in temporary use to furnish the required heat while the workmen were finishing the building, the grate bars were burned out of the heater, and the writer overheard a remark of the owner to the effect that the heater was no good as it had been in service but four weeks and the grate was ruined. This disastrous result might have occurred in four hours. Upon being taken to task the workman attending the plant was positive in his statement that he had kept the ash-pit free of ashes, and yet the writer knew he was telling a falsehood.

Our readers may jot it down as an indisputable fact that where ashes are not allowed to collect under a grate it is absolutely impossible to burn out the grate castings. It requires approximately 2,250 degrees of heat to melt cast iron. The grate is the cradle which supports the coal and the oxygen or air

to produce combustion is passed upward through it. As the metal or iron of which the grate is composed is under the fire it is positively out of the question to think of dissolving it in this manner.

Where large sectional boilers are installed their lengths sometimes makes it difficult to properly clean the ashes from under the grate, and in such cases we suggest that an extra depth of ash-pit be provided similar to that secured by the construction illustrated by Figs. 3 and 4. Fig. 3 shows a cross-section of such a pit and Fig. 4 the ground plan, the size and character of which may be modified to meet existing conditions or certain types of boilers. The provision of this pit will prevent the burning out of the grate through any carelessness on the part of janitor or fireman in not properly removing the ashes.

Another evil practice or abuse we find prevailing is the habit of weighting down the safety valve for one cause or another in an effort to destroy the exact purpose for which it is intended. This is not only a bad custom mechanically but is also attendant with extreme danger and any person guilty of it cannot be too severely reprimanded, the effects likely to result warranting strong criticism.

The steamfitter should explain these pertinent matters thoroughly to his customer in order that he may be saved expense, annoyance and further condemnation through conditions likely to arise by reason of ignorance on part of owner.

The abuse of the heating apparatus can and should be avoided. To the average house-owner the installation of such a heating plant is an event and the apparatus to him is like a new toy in the hands of a child. It appeals to him as a mechanical apparatus, interesting and amusing. The contractor at this time (when the system is first installed) may by extending a little attention to his customer, secure a friend who will be pleased to devote his time and influence, when he consistently can, to assist the contractor to further sales.

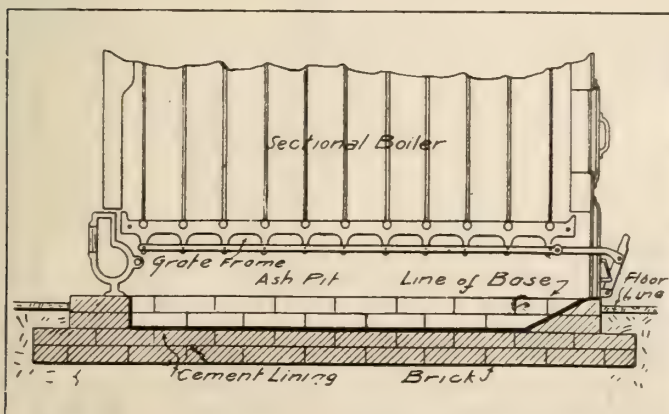


Fig. 3.—Cross section of large sectional boiler.

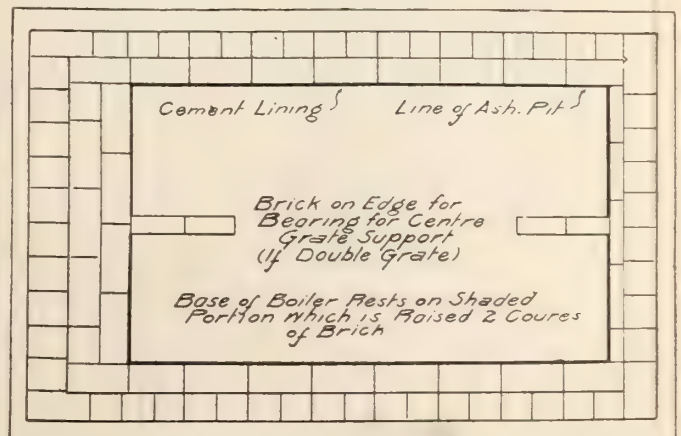


Fig. 4.—Showing ground plan of large sectional boiler.

Complete Course in Sheet Metal Work

By L. W. KOSER

We now have the plan and elevation, the plan shows the measurements of the top and bottom, and the elevation shows the pitch of the sides.

What we want to get now is the radius for drawing the patterns for the sides and ends.

We then construct a diagram as shown by Fig. 3, in the following manner: Draw the base line X-Y of Fig. 3 equal to the diagonal line K-V of Fig. 1. Then project a vertical line from Y as Y-W.

We now want to draw the slanting side the same pitch or slant as shown on the elevation Fig. 2, so we place one point of the dividers at C Fig. 2, and the other point at A, and with the divid-

ers thus set we transfer this distance to the line X-Y of Fig. 3 as shown by the space from X to E.

Then project a vertical line from E as E-F, making it equal to the line C-D of Fig. 2. Then carry a line from X through the point F and continue it until it meets the line Y-W.

Then the space from W to X would be the radius for drawing the pattern for a cone having the same slant and curve as the sides of the ellipse.

Let us now develop the pattern for the large side of the ellipse prob. 31. Set the point of the compass at W and the lead at X, and with any convenient point as centre as P, describe an arc.

Lay off on this are the stretchout of

one side of Fig. 1 as from 1 to 7. Draw lines from 1 and 7 into the point P. This gives us the bottom line of our pattern.

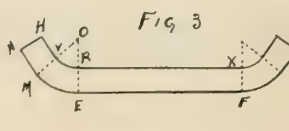
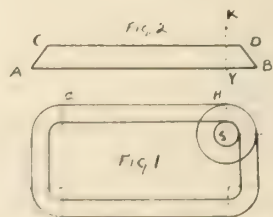
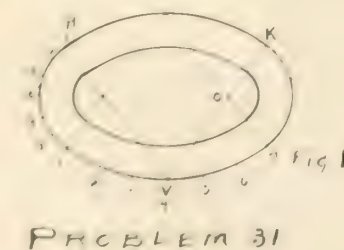
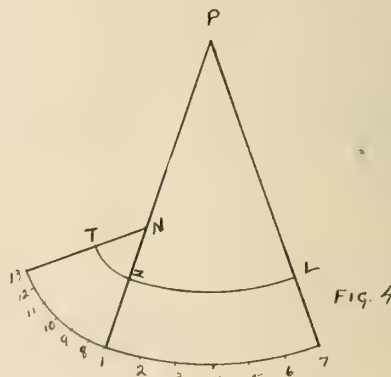
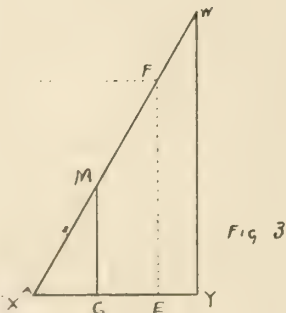
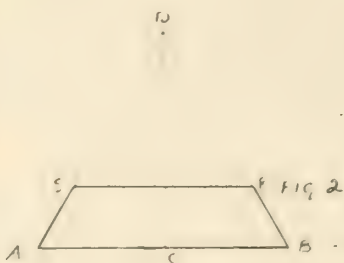
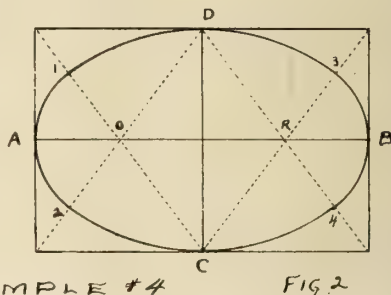
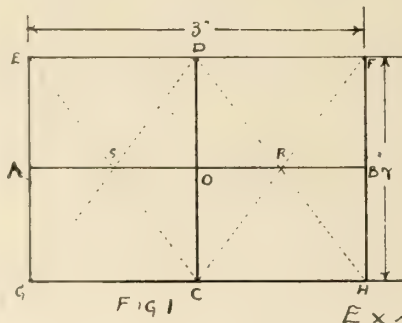
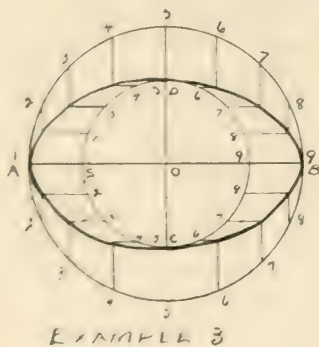
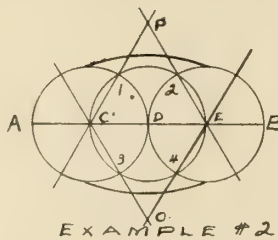
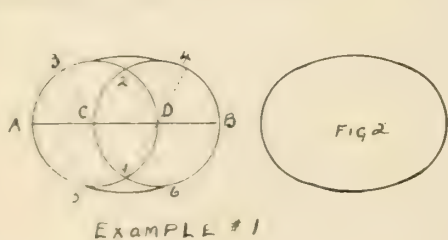
Now set off the distance A-S of Fig. 2 on the line 1-P, as 1-Z. Then with P as centre and the lead at Z swing the arc Z-L. This completes the side of the pattern; the opposite side would be the same.

We now want to get the radius for the small ends.

We therefore transfer the space K-O of Fig. 1 to the line X-Y of Fig. 3, as shown by the space X-G. Then project a vertical line up until it meets the slant line, as shown by G-M.

(Continued on page 20.)

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Tips for Helpers---By "Phoenix"

WHAT PROGRESS HAS DONE FOR PLUMBING.

A short time ago the writer received a letter and among several other questions were the following:—"Will you kindly tell me of some good books to read on plumbing and heating? I know that there are many published, but as I have not time to read them all I hope that you can save me time by answering. Also I would like to know something more about the old-time plumbing."

I'll answer the book question with the understanding that I am not recom-

ordinary education can read and understand it, a point very much to be desired, as I have no hesitation in stating that there are other books on the subject that require the patience and persistence of a college professor to untangle. The aim of this book seems to be entirely instructive and practical. There is also published another book on heating by Chas. B. Thompson. This book is extremely valuable because it is compiled upon jobs that have actually been installed and working—an advantage which all books do not possess. There are plenty of plain, understandable illustrations in this book and the manner in which it is written is very convincing. A very useful and practical little book is called "The Sizes of Flow and Return Steam Mains." This book tells of the actual shop practices in estimating mains of some of the best shops in the United States and is valuable as exemplifying actual shop ways and means.

Sanitation covers a somewhat broader meaning than plumbing, and there is a book named "Sanitation in the Modern Home," that will do anybody good that wants to get general information regarding these questions, from a broader standpoint. It was prepared by J. K. Allen and is certainly worth the time of reading for one who intends to become a master.

"Modern Plumbing," by Starbuck and the "Principles and Practice of Plumbing," by Cosgrove, are two standard works on plumbing which can be read with great profit by those who are in the craft. This article isn't intended for a write-up of books and I trust that I will not be misunderstood in that respect. I have merely mentioned some good works on both subjects that I know will both interest and instruct the party who asked the information in the letter written to me.

In regard to the "old-time plumbing" whole works might be written on the subject and still not do it full justice. I choose to regard this from the very best standpoint and dug around until I found a picture that suited me and you will observe it as shown in Fig. 1. This is one of the best types of toilet rooms that was installed many years ago and cost a pretty penny at the time. Only

the very wealthy could afford to have such an installation in their homes.

Observe that all the fixtures, except the closet bowl are enclosed with wood, most excellent in quality and workmanship. The marble slab and bowl that was frequently dropping off will well be remembered by some of the old timers. Also the lead work, not in sight, which connected up the fixtures.

When it came to cleaning up this room it was a good day's job to get it into any kind of first-class cleanliness—sanitary it never was, please remember.

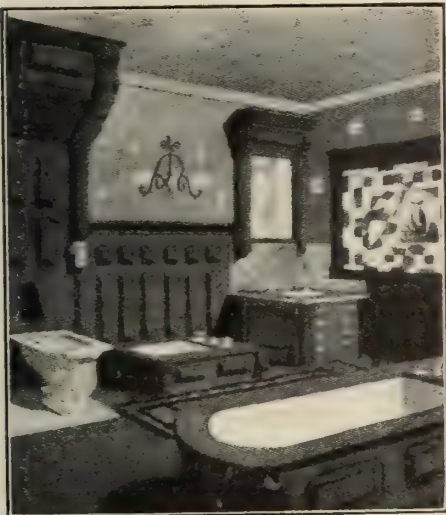


Fig. 1. "The Toilet Room of Our Daddies," an excellent job—30 years ago.

mending any particular book as being better than any other for if I did that I would soon have a lot of authors up in arms against me. Then again a book that strikes one party as just right would not please a second fellow at all, for many reasons, and yet both books might be very good at that.

Then again I have not read all the books on either plumbing and heating and I doubt very much if many others have either. Twenty years ago books on these subjects were rather scarce; now they are as thick as office seekers. There is a book on steam and hot water heating by A. G. King. It contains about 400 pages, well illustrated, and I can state that this book is entirely free from all confusing formulas and is written in such a manner that a person with a very

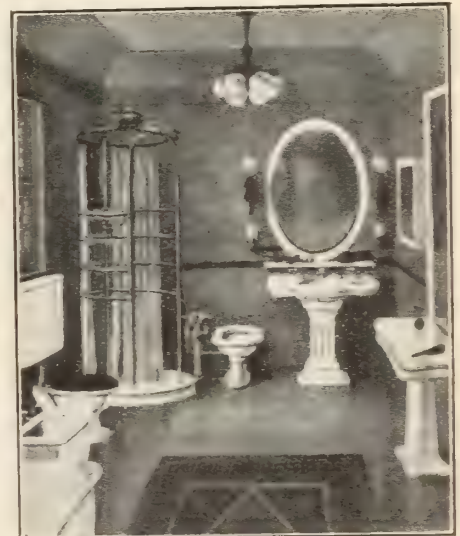


Fig. 2. An up-to-date Toilet Room installed by a modern sanitarian.

Its construction rendered that impossible.

In Fig. 2 there is shown a modern toilet room of the up-to-date class. Now just contrast these two toilet rooms, each most carefully installed and each comprising some of the best fixtures of their day and you will perceive that there has been some progress made along our line of business although there are certain kickers everywhere that claim there is no progress whatever being made.

These pictures are an education of themselves and will stand for a lot of examination and thought. They are well worth pasting in your scrap book if you have one—if not, frame them and have them handy to show on occasion.

The Freezing of Water in Pipes

How the Bursting of Pipes is Explained—Also Some Advantages Which May be Gained Through Freezing Pipes.

The freezing of water pipes in winter is such a common occurrence in the northern latitudes, that it is accepted as a matter of course, and little thought is given to the occurrence further than to thaw the ice and repair the pipes if they have been burst by the process. Yet, when all is said and done there is much about the phenomenon of freezing of water in pipes which the plumber should be familiar with, for not only does this knowledge help him to understand what to expect when he goes to thaw out pipes and explain to the angry housewife, who blames his carelessness in thawing for any leaks which might result, that the damage was already done before he arrived upon the scene; but it enables him to make use of frost as an agency for carrying on his work when occasion requires.

More plumbers are unjustly accused each year of wilfully playing upon a pipe with torch or steam in such a manner as to cause it to leak, than could be counted on the legs of a centipede. The reason for this is that the average person labors under the belief that freezing of water in a pipe does no damage whatever, but that the thawing, if not properly conducted, bursts the pipe.

This old belief is not without some grounds of plausibility to the average housekeeper, for there is within the experience of almost everyone of them one or more cases where on a cold, frosty morning upon going to the kitchen they found a pitcher or some other receptacle containing water which had frozen over night, and upon plunging the pitcher into a kettle of hot water to thaw the ice, were surprised to hear a snapping noise, and find the earthenware receptacle in two or more pieces.

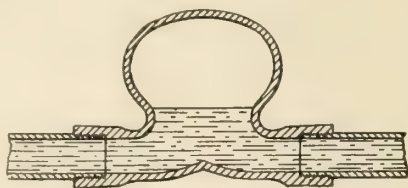
In such cases, the bursting of the pitcher is due to unequal temperatures on the outside and inside of the vessel which causes unequal expansion; the heat of the water outside tending to expand the earthenware and the ice within exerting a pull to contract it, the result of the combined efforts is a fractured vessel, for earthenware is unusually susceptible to sudden changes of temperature.

The expansion and contraction are not the cause of the bursting water pipes when the water is frozen within. On the contrary the bursts are due to an entirely different cause. For pipes may be subjected to extremes of temperature, by plunging when ice cold into hot water, or conversely when hot plunging into ice water

without affecting them in the least. Nor is the thawing of a water pipe what causes it to burst.

The damage is done long before the plumber arrives upon the scene with his torch or steam kettle, but, as the water within the pipes is frozen, it cannot flow out through the bursts in the pipe until it has been thawed. That is why the plumber is blamed. One minute the pipes are apparently in good condition so far as leaks are concerned, and the next moment water is flowing out in all directions wetting ceilings, walls and floors, and the natural inference of those who do not know is that the pipe burst in thawing.

The real cause of ruptured water pipes must then be looked for elsewhere, and the premise may be laid down right here, that pipe bursts from frost are due to the expansion and consequent greater



pressure of water caused by freezing. Everybody is familiar with the way milk projects up through the neck of a bottle in the wintertime, when frozen, in some cases sticking out a full inch above the top of the bottle. If now, such milk bottles were so tightly sealed that the frozen milk could not expand upward into the atmosphere, the tremendous pressure exerted within would break the bottle, just as water freezing under like conditions in a pipe ruptures the metal.

Water pipes then are burst not by temperature but by pressure, and to realize how that can be brought about, it will be necessary to review some of the properties of water. First, it should be remembered that water is practically incompressible, it being compressed only $47\frac{1}{2}$ millionths of its bulk for each atmosphere of pressure, or 14.7 pounds pressure it is subjected to. Further, in cooling, water contracts until it reaches a certain point, 39.1 Fahrenheit, which is known as the point of maximum density, when it begins to expand again, and will continue to expand until the freezing point, 32 degrees Fahrenheit, is reached and the water is frozen solid. In the process of freezing the expansion still keeps on, so that if one gallon of water

were frozen solid, there would be the equivalent of 1 1-9 gallons of ice.

Bearing in mind, then, that in freezing water expands one-ninth of its bulk, and that water is practically incompressible, it will be seen that unless the water can be driven lengthwise, somewhere through the pipe back to the main, that the tremendous pressure exerted will burst the pipe or containing vessel, unless there is sufficient elasticity to the metal to permit it to expand and make room for the increased bulk. Lead pipe will often do this, and most plumbers in cold climates are familiar with expanded places in lead water pipes which have been bulged by the frost so as to become egg-shaped.

The destructive force of freezing water was ingeniously taken advantage of by an enterprising "Yank" just "after de' war." It seems that the government had a number of malleable shells at Boston, which were useless and which they wished broken up to be remelted, without fear of explosions taking place from any containing a chance charge of explosive. Having failed to smash them with sledges owing to the malleability of the iron, they advertised for bids, and accepted the lowest tender, which called for a snug sum per shell, simply for cracking them open.

Gathering the shells together in the open air, the contractor filled them all with water, plugged the vent holes, so no ice could escape and let them stand out in the cold winter night unprotected. The next morning all the shells were split open, the work having been accomplished by the destructive force of the expanding water.

There is another property of freezing water and ice which it is well for the plumber to know about. That is, its ability to flow under pressure and assume new forms, just as clay or other plastic materials can be forced into molds or through tubes or crevices. This is well exemplified in the case previously cited of the familiar instance in which milk contained in a bottle in expanding, forces the frozen core or plug up through the neck of the bottle, sometimes to a distance of an inch or more. This familiar phenomenon has been made use of in an ingenious manner by an inventor to keep exposed water pipes from freezing.

At certain intervals along the line of exposed pipe, the distance depending on the size of pipe, he places an air dome, as shown in the illustration. These domes, by a mechanical contrivance, similar to the "snifter valve" on a

hydraulic ram, keep the domes charged with air, so that they really are a succession of air chambers. The capacities of the air chambers are carefully proportioned, however, to the size and length of pipe, so that ample allowance will be made for the increased bulk of ice when the water becomes frozen, without displacing all of the air in the domes.

The air chambers are likewise designed to facilitate in every way the flowing of ice into them for if obstructions were met at these points and the water frozen there, thus forming plugs at each end of a section of pipe, the subsequent freezing of the water between the plugs would burst the pipe.

From a number of experiments, then, conducted with this object in view, the best possible shape has been formed for the domes to facilitate the flow of ice into them, remain full of air, and trap any free air in the water of the supply pipe.

The object of having the domes full of air, is because air is readily compressible being condensed one half its bulk for each atmosphere of pressure, consequently when expansion takes place in the water, due to the formation of ice, the thrust is lengthwise from dome to dome, and the air readily compresses to make room for the expansion. Of course if these domes were allowed to fill with water as they quickly would if the air were exhausted, they would afford no protection to the pipes during cold weather.

They are kept filled as previously stated by a special snifter valve, or for long lines of pipe, a small air compressor may be used to force air into the water. If the water is overcharged with air, as it would be in such a case, each dome it passed by the water would release some of the air, which rising to the top would fill the air chambers.

Knowing, then, the action and effect of frost on water confined in pipes enables one to devise ways and means for protecting the pipes from damage or of using the destructive force for his own ends and purposes. This we have already seen in the case of bursting the shells and there will now follow an account of how a plumber often calls upon the agency of frost when working on pipes.

Many a plumber has been called upon to repair a leak in a service pipe where there was no stop cock he could use to shut off the water, without digging down to the corporation cock at the street main. That would mean the expense of a permit, digging and repaving the street, and would entail a delay of hours if not days. In such emergencies, the resourceful plumber resorts to freezing, and stops the flow of water during repairs by freezing it tight, back of where the repair is to be made. In doing this, of course, he

must be careful not to freeze the pipe too much or he will undo all of the work he had repaired, by bursting the pipe back of his joint.

The method of proceeding to freeze a pipe is first to provide a good sized cake of ice, and a liberal supply of rock salt, such as used by confectioners for freezing ice cream, common salt will do if the rock salt cannot be obtained. The ice should be cracked so it will melt the quicker when packed with the salt. The plumber then beats the lead pipe together so that no water can flow through, for it would be next to impossible to freeze the water while it was in motion.

As soon as the pipe is hammered shut, the ice should be packed around the pipe, bedded in salt, just as the ice and salt would be prepared and packed in an ice cream freezer, and the plumber can then prepare his pipe for wiping while the water is freezing. Naturally he will have to put in a short section of pipe to replace the leaky portion and the part where he has beat the pipe together and this section can be prepared and the loose end wiped in place, all ready for the one final joint when the water in the pipe has frozen sufficient to hold back the pressure from the city supply.—Plumbers Trade Journal.

COMPLAIN OF OFFICIOUSNESS.

North Toronto, Jan. 14.—Complaints are still heard as to the "officiousness" of the city officials, more especially are the plumbers and drainers up in arms. According to the statement made by one drainer to The Telegram yesterday the chief cause of the trouble is the manner in which inspections are made. They won't make any definite appointment, with the result that the drainer has, perhaps, to lose a day's work waiting around for the inspector to come, or should he happen to come and the drainer is not on the job he will simply go straight away again, which necessitates a new permit on the part of the drainer. Another thing is claimed that jobs which really ought to be passed are not passed, and they turn down good jobs also to the "red-tape" methods. As one drainer remarked: "It is foolish to imagine that city by-laws must be enforced in suburban districts, and until they see this so long will there be trouble. Personally, I am going to give up the job." When asked why, he remarked: "On account of the 'red-tape' and the officiousness of the city officials." One case in point was forcibly illustrated. The city will not allow rain-water leaders to run into the drains. One job on Glengrove Ave. in course of construction complied with this rule, and yet when the plumbing and drain-

age inspector came he refused to look at it until another plan had been prepared, and yet the only difference to the actual work and the plan was that the rain water was shown in plan whereas the drainer, of course, omitted it in the actual work. It is this kind of thing that is causing so much unpleasantness among the local plumbers and drainers at the north end of the city.

NEW OFFICERS AND EXECUTIVE APPOINTED.

At the last regular meeting of the Toronto Society of Sanitary and Heating Engineers, held on Jan. 9, the report of the president dealing with the work of the past year and offering recommendations for the coming year was read. The financial report was also given and passed on to the auditor. New officers and a new executive for 1913 were appointed. These are: President, H. Waterman; vice-pres., A. G. Aggett; treasurer, T. Maxwell; secretary, J. E. Fullerton. The following twelve members constitute the executive: Frank Maxwell, W. Mansell, Geo. Clapperton, Harry Hicks, R. Yeomans, T. J. Hayes, Lewis LeGrow, John Wright, G. Frankland, N. Blumbergh, D. Glynn and E. T. Needham, secretary of executive. It was also decided to hold a Scotch night on Jan. 16 in Albert William's assembly parlors. The program is in the hands of Geo. Clapperton, and a night of fun is expected.

Final preparations are now being made for the annual "At Home" of the Toronto Society, which is to be held in the Forester's Hall on College St. Everything looks like a record night and a bigger attendance than ever is expected.

TAKEN OVER PLUMBING BUSINESS.

G. E. A. Robinson, who for some time past has been following the plumbing and tinsmithing profession in Elora, Ont., has recently sold out to H. W. Weatherdon & Son, of Collingwood. Mr. Robinson has purchased the plumbing and tinsmithing department of J. W. Peacock, 1026 Queen W. Toronto, and will conduct his business at 133 Dovercourt Road.

OPEN UP BRANCH IN CANADA.

The Good Manufacturing Co., of New York City, manufacturers of rubber goods and plumbing accessories, have opened up a Canadian branch at Niagara Falls, Ont. All Canadian business will be handled from that quarter, and shipments made direct from the Niagara Falls warehouse.

Plumbing and Heating Markets

MONTREAL.

Montreal, Jan. 10.—The past year has been a brisk season for the plumbing trade in this city. At times the trade was completely submerged by the volume of business and men were very scarce. Trade is a little quiet just now but the rapid growth in the city will soon start things moving again.

Soil Pipe.—Soil pipe is quoted at 65 per cent. off list price with a very heavy demand.

Soil pipe fittings are selling at 70 to 75 and 5 per cent. off list price.

Lead waste pipe quoted 10 per cent. off list.

Wrought iron pipe in black, quoted as follows:

3 in. pipe	\$19.47 per 100 feet.
2½ in. pipe	14.83 per 100 feet.
2 in. pipe	9.30 per 100 feet.
1½ in. pipe	6.97 per 100 feet.
1¼ in. pipe	5.80 per 100 feet.
1 in. pipe	4.27 per 100 feet.
¾ in. pipe	2.98 per 100 feet.
½ in. pipe	2.57 per 100 feet.
⅜ in. pipe	2.00 per 100 feet.

Galvanized wrought iron pipe is selling as follows:

2 in. galvanized pipe	\$12.80 per 100 ft.
1½ in. galvanized pipe	9.60 per 100 ft.
1¼ in. galvanized pipe	7.98 per 100 ft.
1 in. galvanized pipe	5.87 per 100 ft.
¾ in. galvanized pipe	4.10 per 100 ft.
½ in. galvanized pipe	3.40 per 100 ft.

TORONTO.

Toronto, Jan. 15.—The slack season generally experienced at this season of the year in the plumbing trade has scarcely been heard of this year, and supply houses who are fortunate enough to have any quantity of supplies are kept busy filling orders right along. Soil pipe is as scarce as ever, and shows little sign of being anything else for some time to come. Some lines of boilers are practically cleaned right out, and all boilers and radiators are scarce. A readjustment has recently been made in the prices of enamelware. Some lines have been reduced, but the general tendency is upward.

Soil Pipe.—Discussing the advisability of buying soil pipe this week, one dealer said: "There is little chance of it being any cheaper. Any plumber who has work on hand and is in a position to buy should do so now as delivery will be more easily obtained before March than later." With raw material continuing to advance, and coke not only high but almost unobtainable, there is little chance that soil pipe will see any lower prices for some time.

Iron Pipe and Fittings.—Quick opening valves used in radiators have recently been advanced about 10 per cent. by some manufacturers. Brass fittings are very firm, and likely even to go higher on account of the high prices ruling in copper and tin. As one dealer put it, "If the standard of the goods is to be kept up, prices will need to be raised. Iron pipe keeps steady with good demand for season."

Enamelware.—An effort is being made to readjust prices on all lines of enamelware. Manufacturers have found that at the old price they were losing on some lines, and asking too much on others. On washing tubs, for example, the price was not enough to cover cost of manufacture and resulted in a loss of \$2 or \$3. Accurately revised lists have not yet been completed, but will soon appear before the trade. An advance of about 5 per cent. on a good many lines may be expected.

Boilers and Radiators.—Much the same condition prevails in this line as at last writing. Some styles of boilers are cleaned right out and as for radiators, demand still keeps in advance of supply. One manufacturer states that he has had greater demand this year than ever, and states that he believes the condition general.

Metals.—The outlook on the metal market is for a monumental year in all lines. Mills are far behind with their orders and there is still the same pressure for deliveries. Black and galvanized sheets were advanced 5c per 100 lbs., about a week ago.

Solder.—Prices remain firm and demand keeps fairly good. A sudden change in the weather would help matters very materially.

Lead Pipe.—There is little activity in this line at present time and little chance for change until severe frost burst pipes again. Prices remain unchanged but pretty firm.



COMPLETE COURSE OF SHEET METAL WORK.

(Continued from page 16.)

Then M-X is the radius for drawing the patterns for the small ends. Place the point of the compass at M and the lead at X. Then with the lead placed at 1 Fig. 4, and the point on the line 1-P, describe an arc and lay off on this the stretchout of the end of Fig. 1 as from 1 to 13, and draw a line from the point 13 to the point N.

Set the point at N and the lead at Z and describe an arc Z-T. Thus completing the pattern; allow for flanges.

PROTECTING LEAD DRAIN PIPES.

Editor Plumber and Steamfitter.—Having occasion to run some lead pipes under the floors in a building where the rats are very numerous, I ask if you have ever had any experience in protecting pipes of lead thus placed? L. T.

We have two or three times been up against a proposition like our correspondent states. In one instance we fixed the pipes by springing around them tubes of galvanized iron and in the other we ran the lead pipes in pipes of iron. We regard the second case as the better practice where rats are bothersome and liable to gnaw into the lead pipes.—D.C.H.



COILS OR WALL RADIATION FOR FACTORY HEAT?

Editor Plumber and Steamfitter.—There are several large rooms in a certain factory where heat must yet be put in. Now the question has come up as to whether coils or wall radiation would give the better results. The job will be hot water and if you can furnish any information on the subject I should be very glad to get it.

James Johnston.

We believe that your cause would be best served by using the wall radiation. It is more compact for the amount of heat furnished, is neater looking and stancher and will give less trouble from leaks. If there are many radiators to be installed be sure to use long sweep fittings. In a small house hot water heating job the long sweeping fittings do not cut so much of a figure as they do on a big job where there are several hundred turns made by the water in its course of travel from and back to the boiler or tank heater as the case may be.

Another matter which makes a lot of difference on a big job is the reaming out of the pipes. It takes but a moment's time at the bench, but is most assuredly should be done on a large job in order that the flow of the water be not retarded. We should favor the wall radiation and strung under the windows whenever possible. Paint it black, as that color is very effective, looks well and does not show the effect of dirt, when cleaned, as much as do some other colors. If wall radiation is used in the offices, it would look more "classy" in such places if nicely bronzed in one or two colors. Go over the different places where the wall radiation will be used and make a rough drawing of how it will have to be made up before it comes to you. This will save your having to make some of it over when it arrives, as the manufacturer may send some of the radiation connected differently than you desire otherwise.—D.C.H.



No. 833—Pedestal Lavatory

A trial will convince you that they are a business pulling line. The excellent finish and artistic design is certain to catch the eye of the prospective buyer.

Full particulars upon request.

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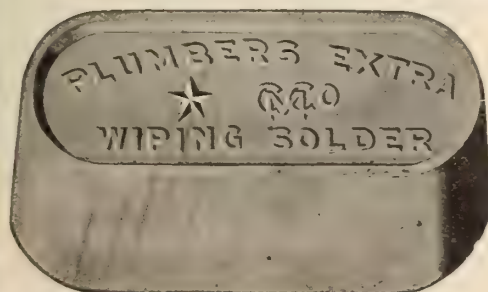
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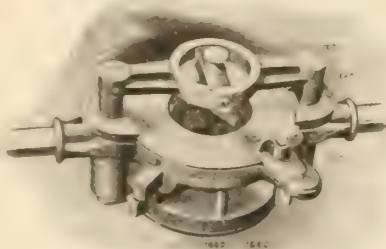
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Work So Easily That A Novice Can Operate Them



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The Premier will thread pipe 1 to 2 inch right, and 1 to 2 inch left with one set of Dies.

The main principles of the Premier are that it not only starts itself on the pipe, but automatically throws itself out after a "Briggs" Standard Thread is cut instead of backing off, which spoils the Dies. The trouble with leader screws and nuts is a thing of the past. The new patented off-set Die which is used in the Premier, has overcome the difficulties. The Die is made in such a way, that once over the pipe, it accomplishes what any other make of die would in going over twice, as one set of teeth is much lower than the other consequently every tooth does an equal amount of work.

The Premier will cut straight and running lock nut threads, and will thread a 5 1/2-inch nipple at both ends without the use of a nipple holder.



Two Dies In One

one size to another. The centering device has a scroll cam, without locks, which operates the three jaws that guide the die stock on pipe.

Be absolutely sure when you are buying a Die Stock that it is the Premier.

No separate bushings or dies to carry around and lose. The Premier has but one lock and that is used only when changing from

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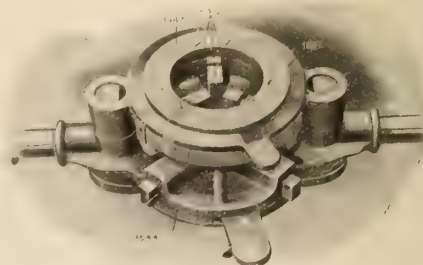
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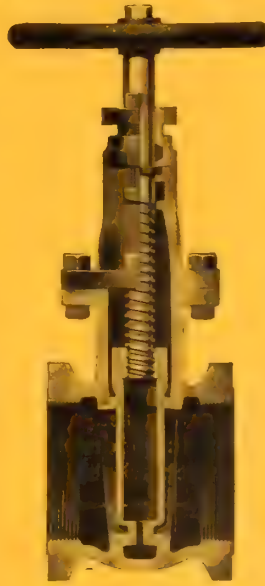


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See Sweet's Index, Pages 1139, 1140, 1141.

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Vol. VII.

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No. 3



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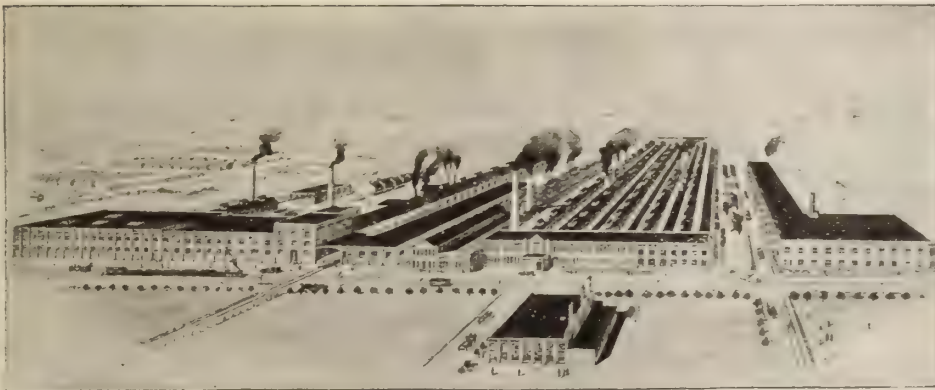
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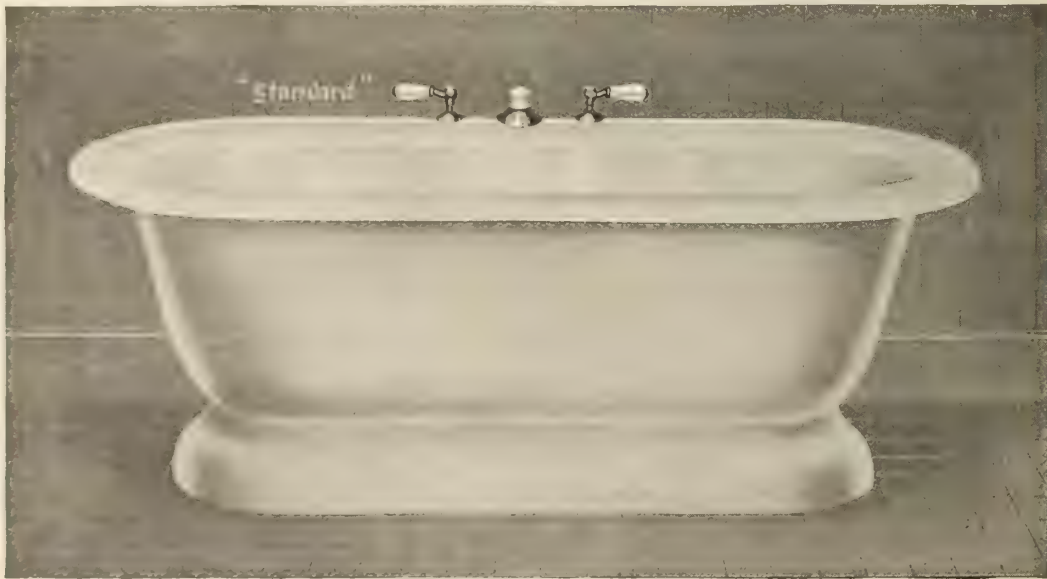
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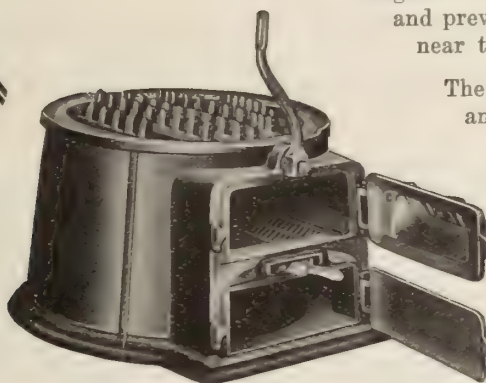
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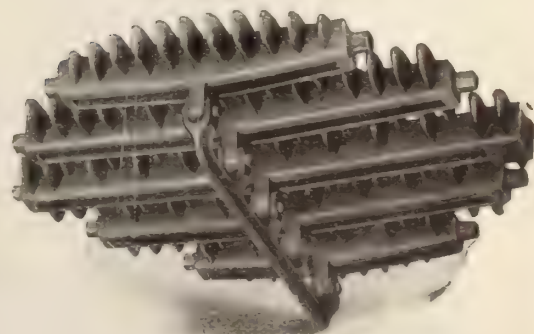
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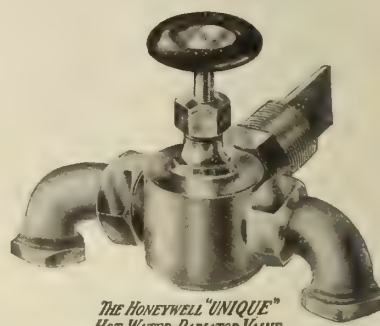
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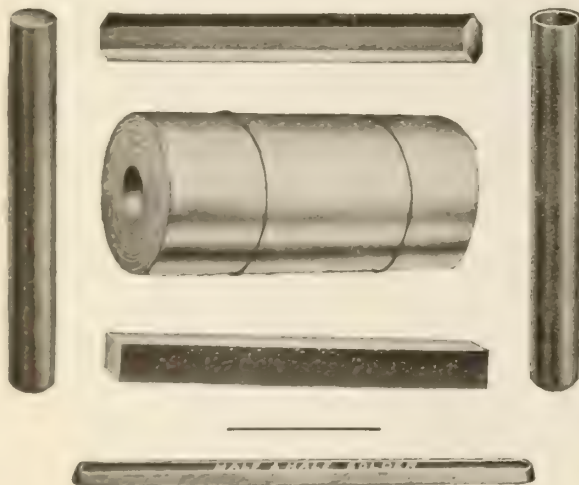
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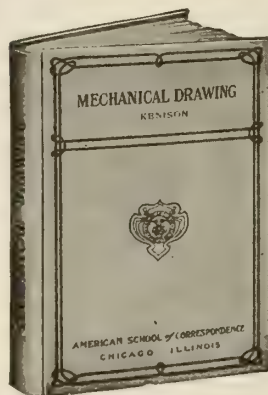


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By Ervin Kenison, S.B.

Instructor in Mechanical Drawing, Massachusetts Institute of Technology

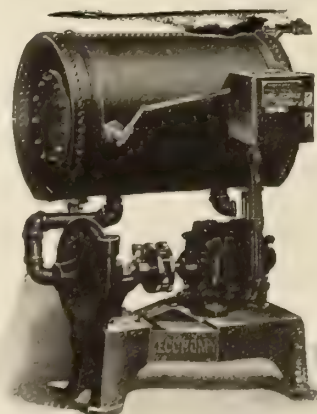
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An expansion tank, an automatic switch and a centrifugal pump automatically operated by an electric motor.

Stimulates circulation by drawing condensation through system, venting the air and returning the water to the boiler at high temperature.

Eliminates snapping and cracking in the radiators and pipes.

A stimulant and governor to the entire system.

A great saver of fuel.

Requires no attention other than an occasional oiling.

Operates equally well on high or low pressure systems.

Tell us your troubles and we will advise you how to overcome them.

THOMAS & SMITH, Inc.

116-18 N. Carpenter St., CHICAGO ILL.

JAS. J. MARTINDALE, 112 Mail and Empire Bldg., Toronto Representative



I'm Nye the Die Man

Why Can I Afford To Talk As I Do About Nye Dyes?

That seems to bother a whole lot of people more than me—or than it does the NYE DIE USERS. I've got something to stand on—to back me up—when I ask you all to

TRY THE NYE DIE AT MY RISK.

I've been long enough on earth to know better than ask a man to try a poor Die on that basis. If I had a poor die I'd never make such an offer, as I have no desire to go broke. But, as it is—

MY DIE BACKS UP ALL I CLAIM FOR IT, AND THAT IS THIS:

Owing to its patented construction, it will operate with less than half the power required to operate any other similar die; it will produce a more perfect thread than any other Die. It is made from the highest grade of tool steel obtainable in the whole world, and every one is guaranteed in writing.

If my Die will do all this I know you want it, and if it doesn't, you don't want it. And so you need not take MY WORD for it—but YOUR OWN EXPERIENCE with the die. I ask you to try at my risk, to be returned at MY EXPENSE. If my claims are other than I state, I guarantee you can't lose one cent, and any bank will tell you I'm reliable.

SEND ME A TRIAL ORDER TO-DAY. NOW—RIGHT NOW, and learn how much better Nye Dies are than any others. You buy Dies, so why not try the Nye Die next time, all at my risk and expense?

THE NYE TOOL & MACHINE WORKS 124 N. Jefferson St., Chicago, Ill. U.S.A.



WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal



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ATTENTION!

You want to make money, don't you? Let us show you how! Push the sale of our AUTOMATIC ELECTRIC CONDENSATION PUMP.

You are surrounded by buildings in which are old, ineffective HEATING SYSTEMS. Our pump can be connected to the system in a remarkably short time, and at once makes it efficient. Our pump operates equally as well on a new Heating System as on an old one, and SAVES 20-50% COAL, and much firing labor. SAVES Digging a Boiler Pit.

We are the only manufacturers of the PATENT AUTOMATIC TILTING TANK RECEIVER, which contains no float or mechanism whatever.

No danger of WATER-LOGGED FLOATS, FAILING FLOAT MECHANISM, or LEAKING TANKS when Float-arm packing wears.

Send us a Post-card for literature.

DON'T PASS UP THIS OPPORTUNITY.

CHICAGO PUMP CO., 904 W. Lake St. CHICAGO, ILL.

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a WANT AD. in this paper

OUR COMPLETE LINE

"KING" Round Water Boiler.

(Sizes 1 to 8½)

"ROYAL" Round Steam Boilers.

"ROYAL" Square Steam and Water Boilers

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"KING" Radiators, Water and Steam.

We have a great deal of pleasure in announcing to our friends in the Trade that **our complete line** of Boilers and Radiators for Steam or Water are now ready for delivery.

We have all sizes, from the smallest to the largest, in stock for immediate delivery.

Prompt Shipment Guaranteed

SEE Sectional View of 36"
"ROYAL" Steam Boiler.

Heating Surfaces

NOTE the **Arched Fire Chamber** and greater **over hanging** heating surfaces, than any other cast iron boiler on the market.

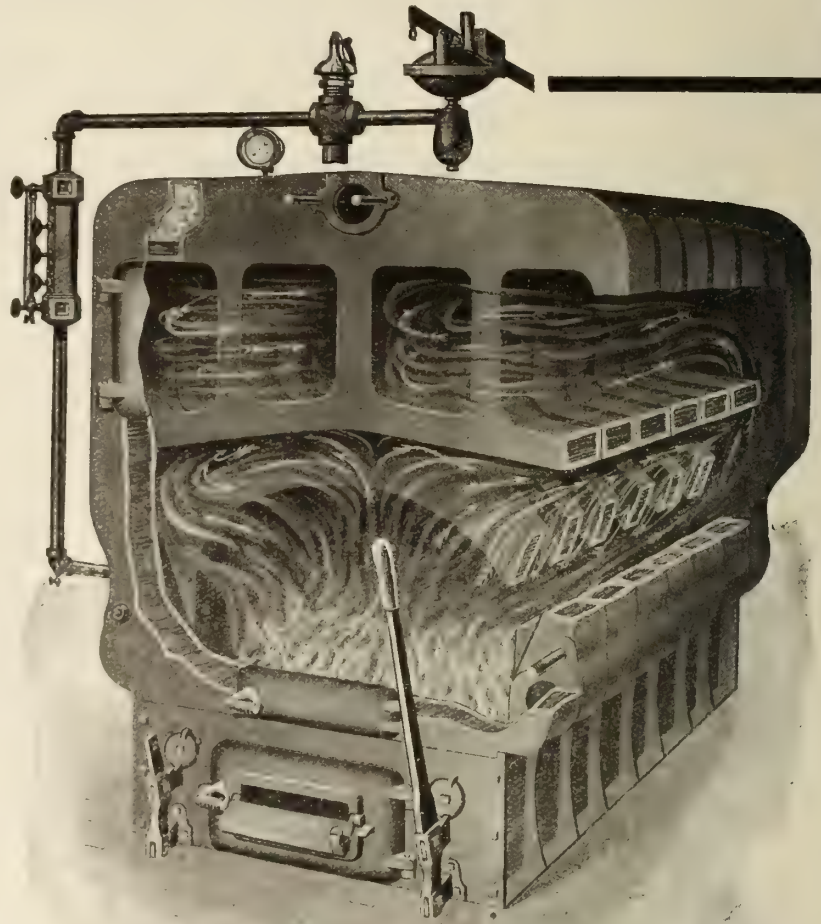
Fire Travel

OBSERVE the **Triple Fire Travel** on **both sides** of boiler, also the **cross fire channels** between each section.

Satisfy your customers. **"ROYAL"** Boilers will satisfy the **most** exacting. **Try one.**

The **"ROYAL"** Boiler carries with it the same unqualified guarantee as the **"King"** Water Boiler.

Get our new Boiler Catalogue, just off the press.



Try us for your Steamfitters' Supplies.

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MONTREAL
138 Craig St. W.

Systems Used in Plumbing Business

Suggestions for Forms to be Used—Estimate Sheets Are of Great Value—Requisition Sheets Should be Used to Keep Track of Material Used—Office “Kinks” for Handling Orders.

Regina, Sask.

Editor, Plumber and Steamfitter:—

Kindly oblige by giving us samples of charts, etc., for compiling contracts, also material and time sheets, as we are desirous of changing our present system of bookkeeping. Anything or any good system you can suggest will be greatly appreciated by

Yours truly,

This is a pretty big order but Plumber and Steamfitter will endeavor to comply by showing some of the best systems in use by Canadian firms. The question of an estimate sheet arises first. After a careful study of estimate sheets used in other places, a special committee appointed by the Toronto association have drafted up a sheet for the use of the members of the association. A copy of the perfected draft is shown below and it will be seen that the sheet contains a most complete list of the different materials required in sanitary work. It was designed to cover all kinds of work, and in this object the committee succeeded admirably.

Books containing a large number of sheets have been issued to the members at one dollar, this price barely covering the cost of the printing. A great many have already started to use the sheets and have found them extremely useful.

PROSPECT CARD

Date	
Name	
Address	
Inquired for	
Quoted	
Will call	
See them	
Prospects	
Employee	

Form which can be used for compiling information with reference to prospective jobs.

Kept for Reference.

One of the best features of the estimate book is the fact that the user need

ways remain for reference and comparison and for use in case of dispute.

It is often a great help to be able to

REQUISITION SHEET

N. B.—Workmen must fill out and sign one of these slips for all material required.

19

TO STOCK-KEEPER:—Please furnish the following

for work

At

Form of requisition sheet on which all material used must be entered.

not tear out any of the sheets which he has used. By leaving them in the book he keeps an accurate record of all his past contract work. The figures will al-

refer back to the figures quoted on past work. One member suggests that it would be wise to put a note at the end of each sheet, after the work has been done, stating the financial results. By doing this it would be possible to ascertain what mistakes had been made in the past and to avoid figuring on the same incorrect basis.

Business System.

It is pretty generally acknowledged that the chief fault to be found with the average master plumber is that he does not attend to business management with sufficient care. He is well versed in the practical end of the business, but is neglectful when it comes to the exercise of proper business principles.

There are exceptions to every rule and some Canadian firms have introduced systems which are models in their way.

One very excellent method provides, in the first place, for looking after all stock. Before starting out, each workman obtains from the stock keeper, the material required. He has to make out a requisition sheet, filling in everything taken, which he signs and hands back to the stockkeeper. If any material is brought back after the work is done, it is credited

PLUMBER AND STEAMFITTER

on the requisition sheet. The sheet is then sent up to the office. It is not possible, therefore, to lose any material or to neglect to charge up the proper amount, except in case of negligence.

Each man has a time book of his own, which he is required to enter up. These books are turned in to the office every night.

The time and material on each contract and job are then taken from the time books and the requisition sheets, and entered on contract sheets, which are afterwards used in reckoning up the contract price.

Sale Slips Used.

All sales of goods made in the shop are entered on duplicate slips, one of which is retained, and the other handed to the purchaser. Borrowed material can be kept track of in the same way. If another firm borrow some tools, they are given a sale slip, and a similar slip is retained. If the tools or materials are not returned, the firm which borrowed them receive a bill for the same.

Looking After Orders.

Difficulty is often experienced in looking after orders promptly. One firm have introduced a system which makes it possible to avoid mistakes of this

kind. On the wall are a number of hooks for the filing of orders. Over each file is a label, indicating the nature of the orders on that file. One file is labeled "Rush," another "Soon," a third "Deliver," and a fourth, "No hurry." As each order comes in, it is filed according to this classification. All "rush" and "soon" orders are given immediate attention. It is not possible, under this system, to forget an order of an urgent nature.

Another good idea is found in the pasting of cost slips on the wall. The cost price is marked in cypher, and the retail price is marked with red ink. As the telephone is close at hand, a quotation can be given on any article at almost a moment's notice.



ANNUAL ONTARIO CONVENTION.

The officers of the Ontario Society of Domestic Sanitary and Heating Engineers are arranging plans for the annual convention in March. It will cover three days and the program will include a number of social features.

From present indications, the attendance will be by long odds the largest on record.

HOLDING UP LANDLORDS.

The following statement appears in a Montreal paper:

Two unusual instances wherein tenants are believed to be using the Health Department as a means to avoid the payment of rent, are under consideration by Dr. Laberge, city health officer. In one case the tenant agreed last May to pay \$75 a month, since when the landlord has received but one hundred dollars. The Health Department is now called upon to order repairs to the wash basin and bath tub, and to take action against the owner of the property. The latter has notified Dr. Laberge that the interior plumbing was in perfect condition last May, and that he will take steps to eject the tenant. The tenant does not respond to door bells and suspicion has been aroused that the sanitary requirements may have something to do with the unpaid rent, as when the Health Department takes an action of the kind described it is assumed the tenant is not enjoying the full benefits of his lease and has recourse against the landlord.

19

Toronto, Ont.,

Contract	Location	Particulars	Amount	Name
1	1000	1000	1000	
2	1000	1000	1000	
3	1000	1000	1000	
4	1000	1000	1000	
5	1000	1000	1000	
6	1000	1000	1000	
7	1000	1000	1000	
8	1000	1000	1000	
9	1000	1000	1000	
10	1000	1000	1000	
11	1000	1000	1000	
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93	1000	1000	1000	
94	1000	1000	1000	
95	1000	1000	1000	
96	1000	1000	1000	
97	1000	1000	1000	
98	1000	1000	1000	
99	1000	1000	1000	
100	1000	1000	1000	

Zone System in Parcel Post Explained

How it is Operated in the United States and What May be Expected in Canada
Unless Exceedingly Strong Pressure is Brought to Bear on Federal Parliament
—Zone System Liable to Lead to Flat Rate Which Would be Highly Profitable to
Mail Order Houses and Disastrous to Retail Trade.

NOW that the United States have a Parcel Post system in vogue, and since Postmaster - General Pelletier has announced in the House of Commons that he is considering something similar for this country, the retail trade should become active in its opposition by first studying the system across the line and then by formulating and putting into action plans to defeat such a measure here.

So far as the United States retailers are concerned the one redeeming feature is that the system is operated on the "zone" plan, whereby rates are higher according to distance from any given post office. If we must have Parcel Post in Canada the trade should make it a point to see that the Postmaster - General does not insist on a flat rate system. The zone system would be much preferable.

According to Distance and Weight.

The zone plan in the United States means that the cost of sending a parcel through the mails will be dependent not merely on the weight of the package, but also upon the distance a parcel is to be transmitted. The United States is probably the only country that has adopted this zone system.

SCOPE OF PARCEL POST SERIES.

This, the first article of the series announced in last issue, deals with Parcel Post as it is operated in the United States. As the Canadian system—if one is established—will probably be modeled along similar lines to that of the country to the south, it was deemed advisable to first explain fully what is likely to come to us if we sit passively by and wait. In future articles of the series the effects of the operation of such a scheme in Canada will be gone into thoroughly. A comparison of conditions in the Old Country with those here will be made, and the question will be considered from the standpoint of cost to the country. There will also be an article on who is behind the scheme—whether the cry for it originally came from the farmer, laboring man or mail order houses. While the series is running, this paper would appreciate the views of any member of the retail and wholesale trade, as well as from manufacturers. The more is known about Parcel Post, the more effectually can it be opposed at the time it makes its debut into parliament in the form of a bill. Let everybody join in the discussion.

Most of the European countries, which are, of course, smaller than either the United States or Canada, have a flat rate whereby a package of given weight is carried for a stated postal fee regardless of its destination.

In the United States there are eight zones bounded by successive imaginary lines practically circles in all cases but that of zone number one, radiating from each postoffice in the land. The accompanying cut shows how they have been decided upon. The first zone is

quadrangular in shape and has a mean radial distance of approximately 50 miles. The second zone is marked by a circle 150 miles across and then come in succession, as one gets farther and farther from the mailing office, circles spaced at 300, 600, 1,000, 1,400 and 1,800 miles respectively and finally the eighth zone that takes in all the territory over 1,800 miles.

Rates For Parcels.

Within the first or 50-mile zone a parcel is carried by the postoffice for a fee of 5 cents for the first pound and 3 cents for each additional pound. This would bring the cost up to 35 cents to send a package weighing eleven pounds which is the limit of weight allowed under the Parcel Post legislation.

If a package is to be mailed to a point beyond the 50-mile limit, there is an increase of about 1 cent a pound for each successive zone through which it is to pass until it reaches the maximum fee of \$1.32 for an eleven-pound package that is to be carried across the continent and thus traverses the entire eight zones. These figures as well as the cost for sending any weight up to eleven pounds any distance are shown in the "Rates of Postage" illustration herewith. This also shows that there is a local rate for parcels which was intended to help counteract the aggressiveness of big city mail order houses. This local rate is applicable only to parcels intended for delivery at the office of mailing or on a rural route starting from that office. It therefore includes parcels designated for delivery within the limits of any city, town or village. This local system calls for a fee of 5 cents for the first pound and one cent for each additional pound up to eleven. Thus an eleven-pound package costs 15 cents.

The illustration also shows that parcels weighing four ounces or less are carried at the rate of one cent for each ounce regardless of distance. Parcels weighing more than four ounces and up to six ounces are mailable at the pound rate.

RATES OF POSTAGE

Parcels weighing four ounces or less are mailable at the rate of one cent for each ounce or fraction of an ounce, regardless of distance. Parcels weighing more than four ounces are mailable at the pound rate, as shown by the following table, and when mailed at this rate any fraction of a pound is considered a full pound.

Weight.	*1st zone.		2d zone		3d zone	4th zone	5th zone	6th zone	7th zone	8th zone
	Local rate.	Zone rate 50 miles	50 to 100 miles	100 to 150 miles	150 to 300 miles	300 to 600 miles	600 to 1000 miles	1000 to 1400 miles	1400 to 1800 miles	all over 1800 miles
1 pound...	\$0.05	\$0.05	\$0.06	\$0.07	\$0.08	\$0.09	\$0.10	\$0.11	\$0.12	
2 pounds...	.06	.08	.10	.12	.14	.16	.19	.21	.24	
3 pounds...	.07	.11	.14	.17	.20	.23	.28	.31	.36	
4 pounds...	.08	.14	.18	.22	.26	.30	.37	.41	.48	
5 pounds...	.09	.17	.22	.27	.32	.37	.46	.51	.60	
6 pounds...	.10	.20	.26	.32	.38	.44	.55	.61	.72	
7 pounds...	.11	.23	.30	.37	.44	.51	.64	.71	.84	
8 pounds...	.12	.26	.34	.42	.50	.58	.73	.81	.96	
9 pounds...	.13	.29	.38	.47	.56	.65	.82	.91	1.09	
10 pounds...	.14	.32	.42	.52	.62	.72	.91	1.01	1.20	
11 pounds...	.15	.35	.46	.57	.68	.79	1.00	1.11	1.32	

*The local rate is applicable only to parcels intended for delivery at the office of mailing, or on a rural route starting therefrom.

The Illustration Explains the Rates in Force.

(Continued on page 20.)

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto; Atahel, London, Eng.

JOHN BAYNE MACLEAN, - President
J. G. LORRIMAN, - - - Manager
T. B. COSTAIN
W. S. FARQUHARSON } Editors

Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, FEBRUARY 1, 1913

Standardizing Ordinances

Considerable interest has been aroused in the trade by the announcement of the meeting at Winnipeg for the launching of an ordinance standardization campaign.

The interest has been fostered by the parties at Calgary, who have been behind the movement, and it now appears assured that the meeting will be largely attended. It is not likely that the Eastern provinces will be represented at the meeting, but steps will be taken to follow it up immediately by getting representative men in Eastern points together.

From present indications, the movement has been safely launched and results can be counted upon if the work is continued with the same degree of enthusiasm that is shown at the present. If interest is allowed to lag, it will not be the fault of those who have been responsible for the first move; for their full co-operation is pledged and they can be depended upon to keep their shoulders to the wheel.

The next step should be for all local associations to discuss this subject at their next meetings and to arrive at a decision as to what steps could be taken to help the movement along. That the trade is in favor of standardization goes without saying. That the trade in all its branches would lend a tacit support also goes without saying. The only trouble lies in the fact that only a small percentage of the trade is likely to lend active support. This could be overcome if the various local associations discussed the matter and decided upon some line of action.

For a number of years back, the bosses as a whole have not been paying much attention to the securing of apprentices. Rather than start in a green lad and make a capable plumber out of him, many bosses have preferred to import a man or, perhaps, coax one away from a rival establishment. The result has been that the number of men developed in the past ten years has not been as large as the expansion of the trade demanded and to-day, good men—that is, plumbers who have served a thorough apprenticeship and thus acquired the desired knowledge and skill—are hard to get. There are, of course, plenty of the other variety to be had—the handy men who have knocked around a little and picked a few of the rudiments of plumbing and are willing on the strength of that to pass themselves off as thoroughly competent men.

It would be wise for the various associations, and for every sanitary engineer individually, to consider this question. The time has come when the apprentice system should be made a prominent feature of every shop.

The complaint is sometimes heard that it is difficult to get boys to apprentice themselves nowadays. Certainly there is a lot of truth in this. Boys do not relish the idea of working for three or four years at what seems small pay when they could probably make more money at something else, where, however, they would not be learning anything. They look at the present and forget the future. This objection should be felt less as time goes on, because the sanitary trade is becoming a more desirable one to learn all the time. The scope of the work is broadening and the possibilities are also broadening out. Boys who start now to fit themselves for work along sanitary and heating lines have a bright future before them.

Should Take on Apprentices

Several large problems confront the sanitary and heating trades, not the least of which is the apprentice question. More difficulty is being found all the time in securing competent help, and the reason is not hard to find.

The weather man has it in for the plumber. Never a burst water pipe to mend all winter, no heating systems to tinker up—and all because Old Probs. has forgotten that cold weather is the usual thing during winter.

Tips for Helpers---By "Phoenix"

"COPPING OUT JOBS."

The ordinary steamfitter or plumber does not, on the average, get in twelve months steady work in the year. In some localities he is exceedingly fortunate if he secures eight months' work per year. Now, while it may be an advantage to stay in one place and not blow money on car fare (provided one pays for the railroad ticket), it is a question if it is not worth while to land a job somewhere else for the "lean months."

I think that the cash balance would favor the steady work, regardless of the transportation. Many of the workmen do not, however, know how to keep the outside work lined up, and, after they know where it is, some do not know how to apply in such a manner that their application will receive attention.

In figures one and two, here shown, there are two letters of application for a job as a plumber. The first is written in a fairly legible hand, but the spelling is bad, the capitals wrong, and the letter does not stack up as to information.

Toronto, Can.
Jan 1 1919.

Mr J. Smith
Dear Sir

do you
want a a no 1 first class
plumber i am one and
want steady work and do
not drink. i am married
and have worked for 20
years at the plummm business. Let
me know soon.

Yrs. respy.
Jim Jones

genl del.

Fig. 1.

This first letter asks two questions and states but five facts, making use of some 38 words.

The second letter, with but nine more

words, states ten facts, and asks no questions, merely implying one at the close. The first letter also recommends its writer instead of letting some one else do it. Few master plumbers care whether or not their men drink, provided that it is not to excess. They do wish, however, to know as to whether or not the man is dependable.

These letters are not outside of everyday realization in our ranks, and, of the two, which do you consider would receive the attention of the man who runs the shop? Writing a letter of application is a distinct business proposition all by itself.

It is not good practice to tell any stranger your whole life's history, although some employers are just prunes enough to ask it. State the main facts, offer references, if requested, and make your wants known all in the briefest manner possible. That will make a letter of from 50 to 100 words long, which should be sufficient. It will probably be more legible if put on the typewriter, and you can have a carbon copy made, thus always being able to know just what you have said—something greatly to be desired sometimes.

To put the words "Gen'l Del." as the address always gives an employer a sense of the unfitness of the applicant. It is the earmarks of a "floater." Think up some reliable address where you can have your mail sent. Many times there are more men on the ground than there are jobs of work for. A first-class man can get in ahead of a bunch of "rummies" if he only can show that he is really "first-class," and he can make the first impression by letter after the manner before stated.

There should not be much trouble to keep tabs on anywhere from five to twenty jobs if the seeker uses any horse sense at all in the matter. Do not promise to go, however, unless you can make good. It only disappoints the master and holds some one else out of the place. No one can find any fault with you for wishing steady employment and for attempting to secure it, but it would not be a square deal to promise to go to ten different places just in order to hold the best job for yourself.

By thus looking ahead it will be found that you can under all ordinary

circumstances secure at least eleven months' work in the year, which, for a little time, trouble and the exercising of some common sense, is very much better

Toronto, Can.
Jan 1st, '19.

Mr. J. Smith
Dear Sir:-

I wish steady employment as a plumber. Can take charge of all ordinary jobs and am a good lead worker.

Am married, 28 years of age and six years a journeyman. Reliable, can furnish references. Am leaving present place because of slack work. Waiting reply, I am,

Yours truly,

James Jones.

Fig. 2.

than laying down in any one town and working only seven or eight months in a year's time. The masters are constantly on the look out for reliable, first-class mechanics, more so than you who read this have any idea of, and when a clean, intelligent letter of application comes to them, if there is any show at all, they are going to give the writer a good try out.



URGED NEED OF INSPECTOR.

St. John, N.B.—An interesting visitor to the city this week was J. W. Bruce, Canadian vice-president of the International Plumbers' Union who was given a hearty welcome by the members of the local in this city. Mr. Bruce is a practical plumber himself and while now associated with the Plumbers' Union has had wide experience in many towns in each of which he has made a thorough examination of the system of sanitation for his own information. He was not long in this city before he told the plumbers and the rest of the citizens at a largely attended meeting that the plumbing system was very bad, and in no city of any size had be found such conditions as existed here.

It was common knowledge, he said, that a great deal of plumbing being done would not be tolerated in other cities, and there was need of a practical plumber being appointed to act as inspector, a need which was recently urged by the master plumbers.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

"PITCHED" ELLS.

Editor, Plumber and Steamfitter.—I have seen once in a while the words "pitched ells" mentioned in your paper. I wish that you would tell just how they are different.—A. H. O.

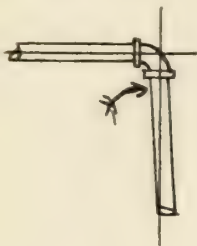


Fig. 1.

We show in Figure 1 a drawing of a "pitched" ell and the way in which it affects the pipe that is screwed into it. Note arrow.—D. C. H.

COMBINFD STEAM AND HOT WATER HEAT.

Editor, Plumber and Steamfitter.—Will you please show me how to accomplish the heating of a room that is on the same level as the steam heating boiler?—J. L. Smith.

In Figure 2 we show how this may be accomplished. The pipe that is marked "1" is the hot water supply to the radiator, which would be preferably of the type called water radiation. Pipe that is marked "2" in the draw-

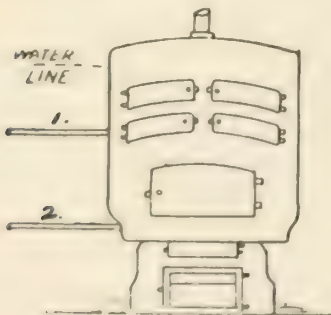


Fig. 2.

ing is the return pipe. The rest of the building can be easily heated by steam.—D. C. H.

STEAM EFFICIENCY VS. HOT AIR FURNACE.

Editor, Plumber and Steamfitter.—Can you give me any figures that will tell me the per cent. that steam compares with hot air in the heat obtained from the fuel?—D. B. Yorke.

It would depend upon the manner in which each job was put in. Granted that the steam job is installed in first-class shape, there is the hot air to reckon on. If the air supply in the latter is taken directly from the outside, we are informed that the efficiency would not be more than about 50 per cent. If the air supply in the furnace was taken from a certain room in the

case where specific usages are required, two-pipe mains with a single branch to radiators will be found all "O.K."—D. C. H.

A DIFFERENT HEATING COIL IN STOVE.

Editor, Plumber and Steamfitter.—Can a coil for heating the range boiler be put in one of the cooking stoves where no provision was ever made for such an affair?—C. K. Rogers.

We think so. In figure 3 we show an affair of this kind which has been tried out and pronounced to be very successful. By making a comparison you will see that it is different from the type of

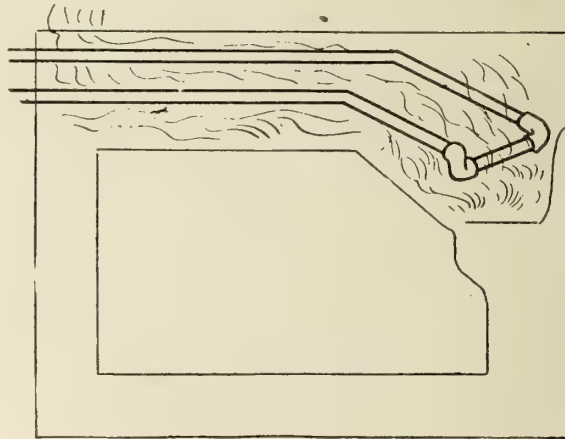


Fig. 3.

house the efficiency might be 75 per cent., or about the same as steam.—D. C. H.

coil usually installed in stoves.—D. C. H.

DIFFERENT WAYS OF STEAM PIPING.

Editor, Plumber and Steamfitter.—Will you please tell me something about the different kinds of systems that are used for steam heat?—New Reader.

There are a great many different patented systems which space would not permit of describing here. Generally speaking, the piping systems come under three or four heads. In the first place, there is the one-pipe system; secondly, the two-pipe system; and, thirdly, a combination of the two. In general, piping practice, unless it is a

STOPPING THE LEAK.

Editor, Plumber and Steamfitter.—I have a pressure R. valve which is defective by having a sand hole near the flange. We have drilled and tapped and plugged with a quarter-inch plug and cannot drill any larger on account of the position of the defect. It still leaks a little, and would be very much obliged if you would give the formula for a cement that will stand 100 lbs. steam pressure. Thanking you if you will place the answer to our request in your next issue.—H. Baker.

We hesitate to advise any cement as withstanding the pressure mentioned,

although some might do so, and believe that you can stop the small leakage mentioned by proceeding as follows:—When the steam is down, remove the quarter-inch plug mentioned and select a single strand of waste, winding the waste into the threads of the plug. Dope the wasted plug with medium thick white lead and screw the plug back to place. It would be well if you could do this while the flange is still hot, as it would give the lead a chance to set before the steam was started. After quitting time would answer very well. This should take up the small leak you mention, but if a drop or two still comes you can caulk with tin foil, as has been described several times in this paper.—D. C. H.

TIN FOIL FOR LEAK.

Editor, Plumber and Steamfitter.—At some time previous I have seen it printed in your paper just how to go about it to stop a leak with tin foil, but in looking for the paper the other day it turning up missing. Now if you will kindly tell me once more I will cut it out and paste it up in the shop.—James Riley.

This method was given to us by an old steamfitter, who said that it never failed if carried out properly. It is as follows:—Secure a bunch of tin foil that has not been all pressed into small compass. You can generally find it at some cigar store, and get a lot of it for almost nothing. If using it to caulk the leak, loosely roll it in the form of a cigarette and wind around the face of the tee or ell, or hold over the sandhole. Then take a small, dull cold chisel and a light hammer and caulk the tin foil just the same as you would caulk lead or soft copper wire. It may be necessary to make two or three caulking, but you will succeed. The tin foil is the best thing for this purpose that the old steamfitter ever used in a practice of over 25 years. It works on either heating or plumbing.—D. C. H.

ADJUSTING THE AUTOMATIC DAMPER.

Editor, Plumber and Steamfitter.—Will you tell me about how much steam it should take to close the automatic damper that goes with the ordinary house heating boiler?—Fitter.

It depends upon the regulator. Some work better than others, but we should say that under ordinary circumstances you should not have any trouble in bringing it down to one-half a pound if it were desired. In some cases we have been able to adjust it to close at a quarter of a pound. If pullies are used look to it that they do not catch, and also that they work as easily as possible.—D. C. H.

ESTIMATING RADIATION.

Editor, Plumber and Steamfitter.—Will you please tell me if it is right to allow one square foot of steam radiation for every three square feet of glass surface?—C. J. C.

Probably it is, according to the rule from which you take the information, which is to allow one square foot to three square feet of glass and one square foot of radiation to every 30 square feet of exposed wall, and one square foot of radiation to each 100 cubic feet in the room.—D. C. H.

SHOWER BATHS.

Editor, Plumber and Steamfitter.—Kindly tell me if the shower bath has any advantages over any other kind.—P. B. Williams.

Some of the advantages are the use of running water; greater cleanliness in places where many people are compelled to use the same bath, and also a great stimulating effect which is produced by the effect of the jets of water striking the body.—D. C. H.

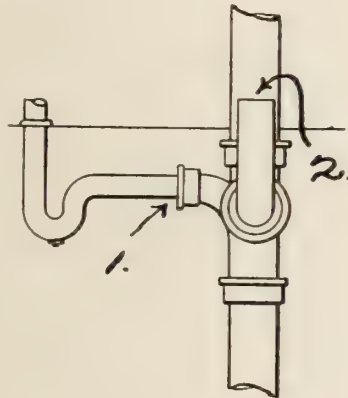


Fig. 4.

IS A RE-VENT CALLED FOR?

Editor, Plumber and Steamfitter.—In the drawing I send you (Fig. 4) the pipe marked "1" is drain from the bath tub, while "2" is the closet. I wish to ask that if it would be necessary to re-vent the tub waste?—X. Y. Z.

If there are other fixtures above those shown we believe that a re-vent would be necessary. Otherwise, generally not.—D. C. H.

HOW MUCH WILL A HEAT REGULATOR SAVE?

Editor, Plumber and Steamfitter.—I have seen it claimed that one of the many heat regulators will save a lot of fuel. Can you tell me just how much?—Show Me.

We believe that certain manufacturers claim a saving of anywhere between 20 and 30 per cent.; but, in order to be perfectly sure in the matter,

we think that you had better write to some of them and state just what your heating proposition is. They will, undoubtedly, be able to then advise you exactly the amount of fuel that can be saved on the job you submit.—D. C. H.

TRAP SEALS.

Editor, Plumber and Steamfitter.—I sometimes see in the paper that the traps sometimes siphon. Now, could this not be done away with if the seal of the trap was made, say, twice as great as it generally is?—M. V. T.

We do not so believe. If the trap seal was twice as great as customary the depth of the seal would tend to retard the flow and cause stoppage.—D. C. H.

AIRING OUT THE BATH ROOM.

Editor, Plumber and Steamfitter.—A certain party called me to look over the bath room, and I found some odor. They want me to tell them how to overcome the difficulty. Can you give me any suggestions in the matter?—S. R. Jenkins.

In cases where the bath rooms have odors it sometimes happens that the plumber is not to blame at all, and it is simply a case of common neglect on the part of the housekeeper. In other words, the room is dirty. Look it over carefully and don't be afraid to tell the truth. Let them thoroughly clean the room and have it painted, and then if there are odors write us, sending a layout of the room, and we will endeavor to give it full attention.—D. C. H.

RADIATOR EFFICIENCY.

Editor, Plumber and Steamfitter.—Why are six column-radiators used? Will they throw off any more heat than one or two column radiators?—R. R.

A six-column radiator would be used to secure a given amount of radiation in a limited amount of space. We believe that, speaking generally, six-column radiation is not considered as efficient per square foot as radiation of the one or two-column type.—D. C. H.

"PITCHING" STEAM PIPES.

Editor, Plumber and Steamfitter.—Is it better practice to "pitch" a steam pipe (the main supply) towards or away from the boiler?—V. V.

We believe that it is considered the better practice to incline the steam main away from the boiler, because it will then assist in removing the condensation.—D. C. H.

The Development of the Switch Damper

THE history and development of the switch damper in mechanical ventilating work, together with a description of methods for minimizing duct work in such installations, were the outstanding features of a lecture delivered by William J. Baldwin, December 7, at the Brooklyn Institute

the results of such confinement could not be gauged in so brief a period. "Fans in closed rooms," he added, "will give cooling effects, but they do not change the quality of the air and sickness must follow. In France a favorite method of committing suicide has been to shut one's self up in a room with a charcoal fire. In a room containing 600 cubic feet of air space, the burning of 1 lb. of charcoal will add 6 per cent of CO₂ to the air of the room. This addition of 6 per cent. lessens the amount of the original oxygen four parts for every six parts of the product. Thus, the condition is soon reached

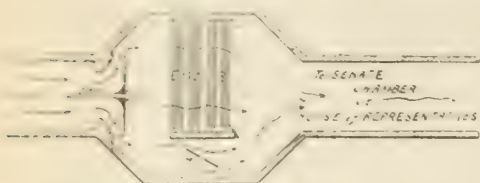


Fig. 1.—First application of switch valve in Capitol at Washington, joint work of Joseph Nason, Robert Briggs and Gen. Meigs (1853).

Switch valve shown at M. Apparently no provision for shutting off air from coil.

of Arts and Sciences, under the auspices of the engineering department.*

Mr. Baldwin opened his lecture by quoting briefly from the recent statements regarding the effect of vitiated air on the human system made by Dr. Leonard Hill. He said the experts were now divided into three classes: (1) Those who believed in no ventilation; (2) those who advocate natural ventilation; and (3) those who advocate systematic ventilation. Referring to Dr. Hill's experiments, in which he kept a number of young men confined in an

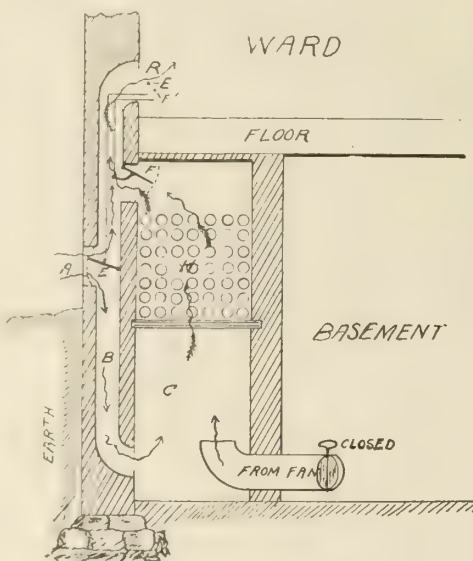


Fig. 3.—Switch valve designed by Dr. John S. Biltings, used in Johns Hopkins Hospital (1880).

Air could be taken direct from out-of-door, through coil from out-of-doors, or through coil from fan system in building.

where there is relatively no oxygen or insufficient oxygen to support life.

"There is no fault to be found with natural ventilation; any ventilation is better than no ventilation. Generally speaking, however, air cannot be admitted to a room in winter weather at the outside temperature, if admitted in large quantities, as in a school, and it should therefore, be 'tempered.'

"A physician has characterized as 'canned air' that which has been warmed to 400 degs. F. In the first place, it is practically impossible to heat air to that temperature, but admitting that it could be done, it seems to me that such heat-

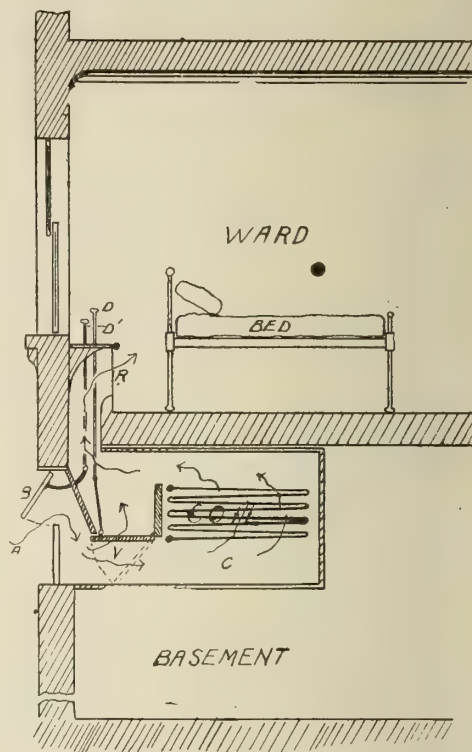


Fig. 4.—Switch valve in Massachusetts General Hospital.

Upper part of basement windows used as air inlets.

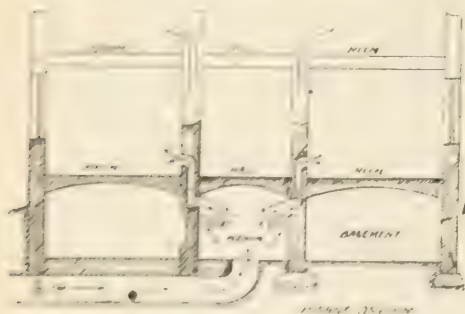


Fig. 2.—Later development of switch damper by Joseph Nason (1850-1860).

By opening slide in radiator case, cool air passed over radiator. No means of shutting off air from coils.

air-tight chamber, where they suffered no ill-effects so long as the air was kept in circulation, Mr. Baldwin declared that such tests were not conclusive, as

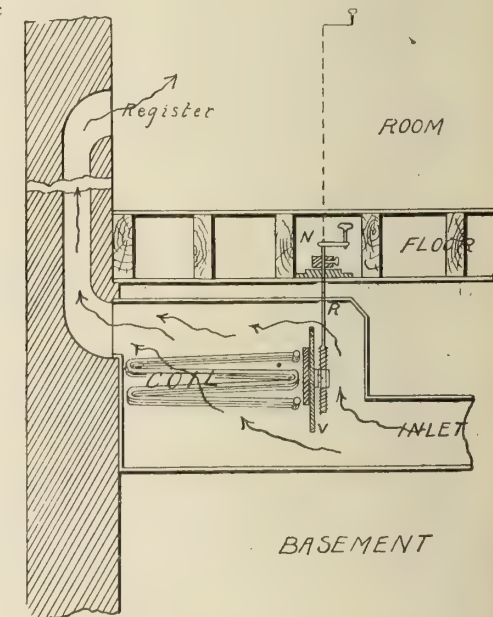


Fig. 5.—Switch valve in Public school.

Simple slide at end of heat coil, designed to move up or down.

ing would serve to sterilize it and make it all the purer. It is certain that all the germs it contained would be killed. As a matter of fact, however, steam at 5 or 6 lbs. pressure will not heat the air over 140 degs. or 150 degs. F., and engineers do not ordinarily heat it even to that extent."

With this introduction, Mr. Baldwin stated that it was not his purpose to devote his lecture to a discussion of these points, but rather to the various methods that had been used for securing systematic ventilation. This brought the speaker to the origin and use of the "switch damper," designed both for mixing the air and controlling the temperature. Incidentally, Mr. Baldwin showed how the switch damper can be utilized for regulating the humidity (as described on another page of this issue).

in-favor of returning to the 'up draft' method.

"The first switch damper was arranged so that the fan drew the air

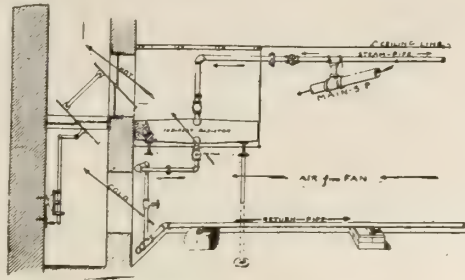


Fig. 7.—Switch damper designed for Paterson, N.J., Public School (1890). Johnson system valve, automatically controlled.

through the heating coils. This was later changed to force the air through, and this arrangement is still in use in the Capitol, together with the original fan."

From this beginning the further development of the switch damper was shown by numerous lantern slides, which are reproduced herewith. In the case of the Insane Asylum at Kalamazoo the speaker showed how the arrangement caused alternating hot and cold puffs of air, while the system designed for the Sloane Maternity Hospital, in New York, the use of double flues was pronounced highly satisfactory from a ventilating standpoint, but was found impracticable for general adoption, due usually to the lack of space for running such flues in the walls, while the building laws also interfered with this arrangement, unless the walls were made quite thick.

"The tendency of the times," continued the speaker, "seems to be to run

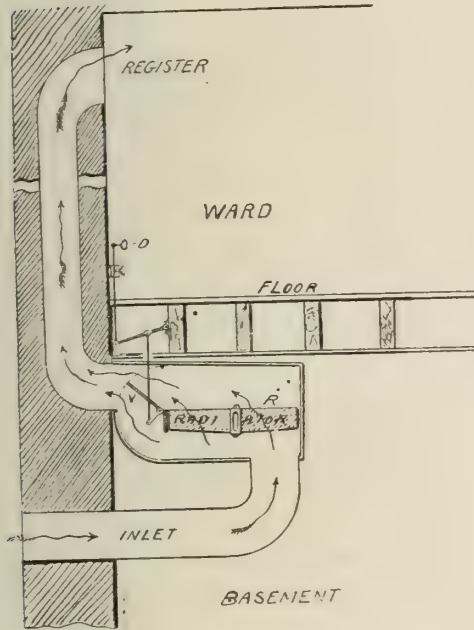


Fig. 6.—Switch valve for school (1885-1886).

"The first switch damper of record," he said, "was used in the Capitol at Washington, and was designed by Gen. Meigs, U.S.A., to give mixed and tempered air through revolving disks under each desk. The ventilation of the Capitol was altered many times because people's feelings differ, the old requiring different treatment from the young, and a system that was satisfactory to one set of legislators would not be tolerated by a succeeding Congress. In Albany, it will be remembered, the same method of using disks or openings under the seats was once used. The apparatus was afterwards put in the ceiling, and the air forced downwards, but this was not satisfactory to all, as the 'down drafts' could not be tolerated by some. Being called in on this case, I reported

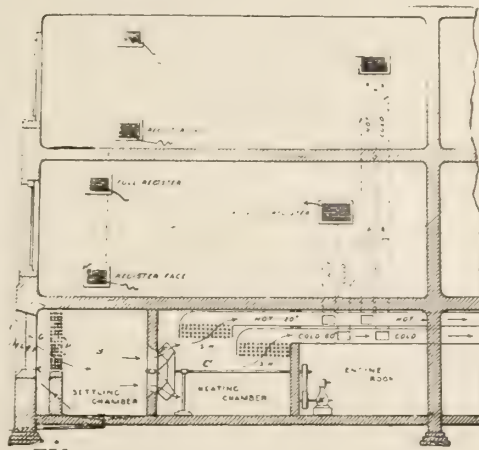


Fig. 8.—System designed by Wm. J. Baldwin for Vanderbilt College of Physicians and Surgeons (1893).

One of the first systems using hot and cold air flues carried to registers. Permitted individual control of temperature of incoming air at each register.

into complicated apparatus. This is a backward movement, and is largely responsible for the adverse criticism of the physiologists.

"When I go into a building and find a complication of pipes that I cannot decipher—after giving a lifetime to the subject—I find an excuse for the harsh criticism of the doctors. 'Simplicity' should be our motto and not a network of 'warm air pipes,' 'cold air pipes' and 'vent pipes,' beautifully arranged from the standpoint of the sheet metal workers; but an abomination from the sanitary point of view."

Mr. Baldwin concluded his lecture with a number of slides illustrating his own practice in arranging the heating and ventilating apparatus in separate

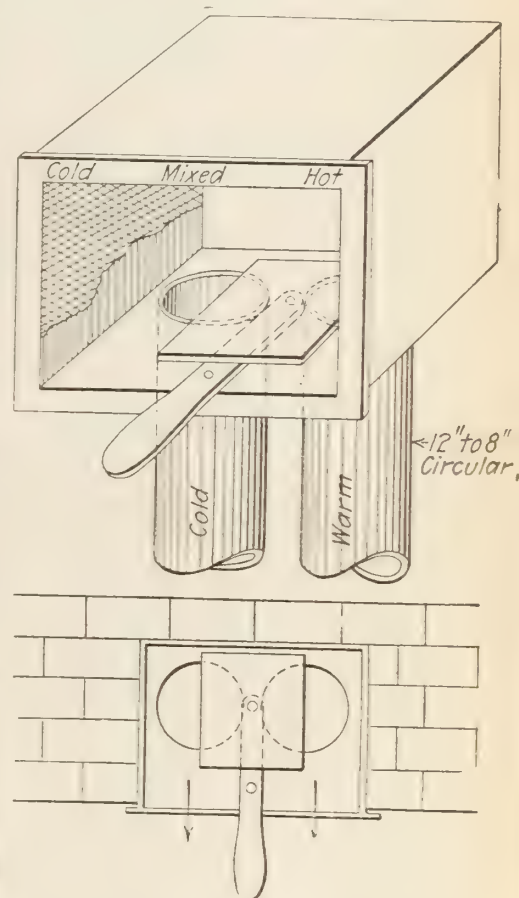


Fig. 9.—Switch valve, College Physicians and Surgeons and Sloane Maternity Hospital (1883).

corridors, at the sides of the basements, thus obviating to a large extent the use of sheet iron ventilating ducts. He also showed instances of the reverse of this practice where the basements were practically honeycombed with air ducts and where in one case, that of the residence of Mr. Cornelius Vanderbilt, the ducts were so interwoven as to be almost impossible to clean. This, he said, was a most important feature, for it

(Continued on page 20.)

We will then lay out the space A-C on the pattern as shown by E-R, and F-X, and project vertical lines up past these points.

Then with the point of the compass set at K Fig. 2 and the lead at B, and with the lead set at E Fig. 3 and the point on the vertical line as O, describe the arc E-M, and lay out on this the stretchout of the outside corner of Fig. 1. Then with the point at O and the lead at R describe the arc V-R, thus completing the pattern for the corners.

Then lay out from this one-half of the straight end of the article, as shown by N-M-H-V.

Treat the other side in the same manner, and allow for laps and flanges.

On plate 23 we show how to develop all the patterns for a window or door cap shown by "Fig. 1."

Also how to prepare the surface for, and erect same as shown by Fig. 2.

At points 1 and 2, Fig. 1, we have oblique or "Cable Mitres," and at point 3 we have "Square Mitres."

The development of the two oblique mitres and the square mitre is shown by Prob. 1, Fig. 1, 2, 3, and 4.

Then we have the development of the Star "S" shown by prob. 2, Fig. 1, 2, 3, 4 and 5.

Then the developments of the end brackets shown by prob. 3, Figs. 1, 2, 3, 4 and 5.

Then the Modillion Brackets "M" shown by prob. 2, Figs. 1, 2, and 3.

The flat part of the cap where the star goes and the Modillion course can be made from the elevation, Fig. 1, and the section or detail, Fig. 2.

Let us now draw the elevation Fig. 1 as near as possible to that shown, then the detail of reveal, Fig. 2.

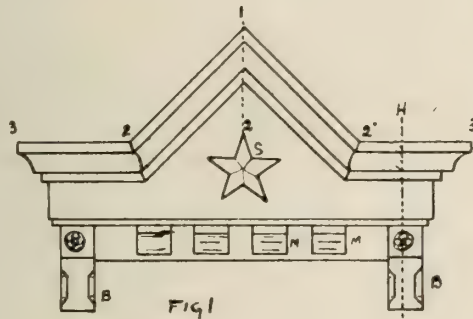
In drawing the detail we first draw the wall line A and B, then the profile of the cap.

The point "a" on Fig. 2, represents a cloak flashing let into the brick or wall, and turned down over the turned-up edge of the cover.

The profile from C around to D represents a cross section through the centre of the cap at the top as 1-R, Fig. 1, and from D to E represents the profile through the end on the line H-K, Fig. 1.

To hold this cap in place wooden bricks are first built into the wall, that is if the building is just being built. If, however, the walls are up, then it will be necessary to plug them, i.e., holes are chiseled out and wooden plugs are driven in, then 2-in. x 2-in. strips are nailed to these bricks or plugs, and the wooden brackets or lookouts, (cut to the profile of the cap), are then nailed to the strips.

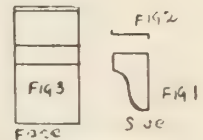
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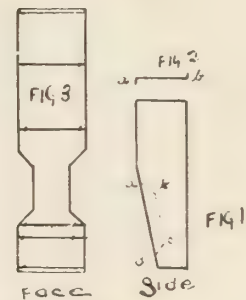
Window or Door Cap



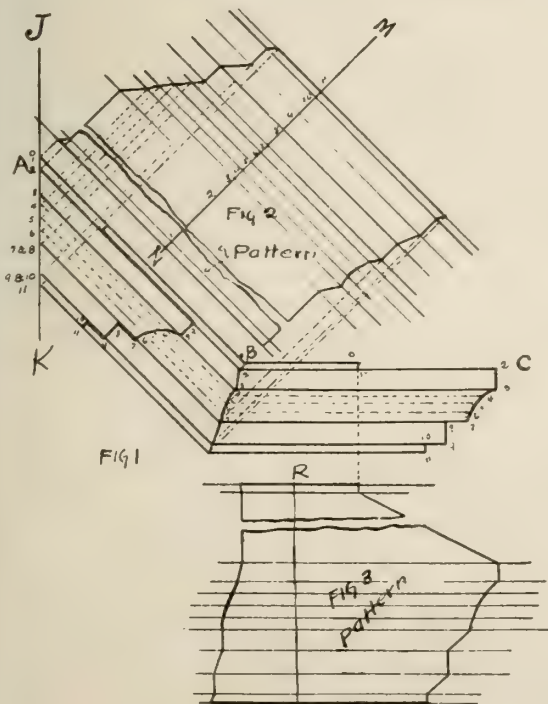
Detail of Reveal



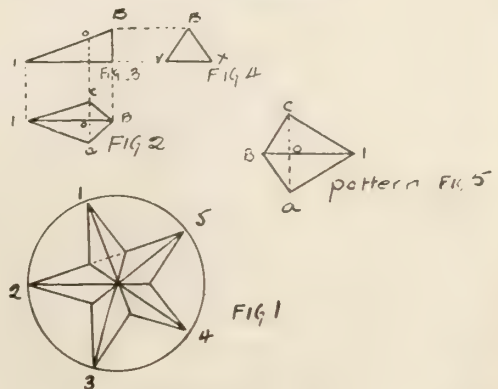
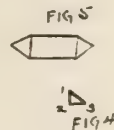
PROBLEM 4



PROBLEM 3



PROBLEM 1



PROBLEM 2

Value of Main Trap House Sewer Connection

For the last five years a British committee has been investigating the relative advantages of the main or intercepting trap commonly placed in the house connections of sewers. This committee had the co-operation of many city officials and sanitary experts in conducting the investigation. Many valuable and interesting experiments were made, and over 5,000 traps in service were examined. The committee submitted its report in the latter part of August this year. The summary and conclusions of the committee, with a selection of the more important passages of the report is published in the current number of "The Surveyor," from which the following matter is taken:

Disadvantages and Advantages of the Main Trap.

The disadvantages of the main trap are four in number, as follows: 1. The trap forms an obstacle to the ventilation of sewers through the house connection and soil pipe, and sewer ventilation is thereby rendered difficult and expensive. This prevention of sewer ventilation through the house drainage system is considered the chief advantage of the trap. 2. The use of the trap involves separate ventilation of the house drains and this necessitates the provision of a fresh air inlet to the drain. Owing to the erratic behavior of air currents this fresh air inlet may become the outlet for foul air, thereby causing a nuisance. 3. The inclusion of the main trap in the house drainage system increases the cost of the drainage system, not alone by the cost of the trap, but also by the cost of the air inlet, and in other ways. 4. The trap is objected to because it forms a serious impediment to the passage of sewage from the house drainage system to the sewer. This frequently results in serious blockage of the drain.

An incidental advantage claimed for the trap is that it prevents the passage of rats from the sewer into the house drain. Such an advantage, if it existed, would be very great in connection with plague. However, rats have been observed to pass through the main trap, both from sewer to drain and from drain to sewer.

Summary and Conclusions.

The summary and conclusions of the committee follow. The disadvantages involved by the use of the intercepting trap are substantial and of serious practical importance, and as the most important of the effects of these disadvantages are concealed from view, they may remain in existence quite unknown

to the householder. On the other hand, the construction of house drainage may be simplified by the omission of the intercepting trap. The disadvantages of the trap may to some extent, be obviated. Thus, the objectionable features of the fresh air inlet may be overcome, apparently without detriment, by omitting this contrivance altogether. The only "ventilation" which appears to be required on a house drain apart from anti-syphonage pipes, is that which should be provided by an opening at the top of each soil pipe.

Liability to Blockage.

The tendency of the intercepting trap to retain a considerable proportion (averaging, according to our experiments, from 42 to 79 per cent.) of the solid matters of the sewage passing through it at any given time, and thus to favor blocking of the trap as well as putrefaction of the sewage before it reaches the sewer, may be diminished to a great extent by using a trap of smaller diameter than is customary at present. The liability of the trap to become blocked appears, however, to be insuperable, and it is this liability which constitutes its most serious disadvantage. The accumulation of sewage in the drain produced by the block, and from which many undesirable consequences may follow, is not usually evident with ordinary use of the drain, and therefore may long remain undiscovered. This unsuspected blocking of the trap and accumulation of sewage appears to be very common, evidence of it having been found in more than 23 per cent. of 5,600 traps, which were specially examined.

Although the liability to blocking is inherent in any intercepting trap, its evil effects can be minimized by constructing the house drain, or at least the lower part of it, of iron pipes, and by closing, with a removable cover, the usual open channels in the inspection chamber which is provided as a means of access to the trap. The object of these measures is to ensure that the effects of a block at the intercepting trap may become evident as soon as possible, and may admit of easy remedy without nuisance arising, and also to reduce to a minimum the chance of leakage from that part of the house drain which must be filled with sewage before a block at the intercepting trap can be discovered with ordinary use of the drain.

Barrier to Sewer Air.

On the other hand, it seems to be established that the trap does serve as an effectual barrier to the entry of sewer air into the house drain, which is the fundamental advantage claimed for it.

It is not liable to be forced and rendered useless, as has been supposed to be the case, by pressure of air from the sewer. This, it would appear, is chiefly because sewers are not air-tight under practical conditions, and therefore air in a sewer finds easier outlets than the water seal of the trap. The pressure which is likely to force the intercepting trap is limited to that which arises in the sewer connection after its opening into the sewer has been submerged, that is to say, after the aerial continuity of sewer and sewer connection has been destroyed. Likewise, the volume of air which can be forced through the trap is limited to that contained in the sewer connection.

Furthermore, when an intercepting trap has been forced in this way, the water seal is not destroyed. When the pressure is relieved the trap will remain sealed, though, it may be, to a less depth than formerly, and therefore air is likely to pass continuously through a trap once it has been forced.

In the absence of the intercepting trap, the traps on even an unventilated house drain are, similarly, not liable to be forced by pressure from the sewer, and they are not liable to be forced even after the sewer connection has been submerged, provided the house drain is furnished with a proper ventilating shaft.

If, owing to exceptional circumstances, such as the absence, or the blocking, of the ventilating shaft of the house drain, pressure is exerted against the traps on the drain, only one trap is likely to be forced—namely, that which has the weakest water seal. Air from a drain is not likely, therefore, to pass into a dwelling through a trap, unless it so happens that the weakest trap of all the traps on the drain belongs to one of the sanitary fittings inside the house. In this connection it needs to be borne in mind again that the water seal of an efficient trap which has been forced is not destroyed. At the same time provision should be made, as indicated in our report, against the tendency of ventilating shafts to become blocked by rust.

The main sources from which air from the sewer may gain entry into a house, in the absence of an intercepting trap, are defects in the drain and the open top of the soil pipe or ventilating shaft, such entry being in either case merely passive, or actively induced by aspiration, in consequence of differences of temperature. The entry of sewer air into the dwelling through defects in the drain may be practically excluded if the house drain is constructed of iron pipes.

An iron drain can be made absolutely air-tight without serious difficulty, and usually remains air-tight, contrary to what is feasible in the case of stoneware drains. It is probable, therefore, that the entry of sewer or drain air into a house can be limited in practice to what may come from the ventilating shafts outside.

Assuming that, in a given case, air from a drain or from a ventilating shaft can enter a house, the essential question is whether there is any difference, so far as the inhabitants are concerned, between the entry of sewer air plus drain air and the entry of drain air alone. For if in the absence of an intercepting trap, sewer air, together with drain air, can escape from a given drain or a ventilating shaft into a dwelling, it is equally possible, assuming the presence of an intercepting trap, that drain air alone will escape into the dwelling.

We have collected and carefully considered the chemical evidence, the bacteriological evidence, the results of recent and exact experiments on animals, as well as the general and epidemiological evidence, in their bearing upon the existence of definite risk to health as a consequence of the access of sewer air into the house drain in the absence of the intercepting trap. It is difficult to summarize this evidence, and it must, therefore, be studied in the body of our report. Briefly, however, it may be said that the chemical evidence shows that the most frequent characteristic of sewer air is the presence of smell. This smell is due to the presence of certain volatile substances given off from sewage in such minute quantities as to be harmless in themselves, apart from smell or possibly, to effluvia from moulds which may be attached to the walls of sewers. It is established that the smell of sewer air is only very exceptionally due to sulphuretted hydrogen, contrary to what has been supposed, and that this dangerous gas is usually not present, even in minute traces, in the air of sewers.

Bacterial Dangers.

The bacteriological evidence shows that micro-organisms of sewage origin are very rarely present in sewer air. On the other hand, they may be present in drain air in large numbers. This difference is the result of the splashing of sewage which occurs in drains, and which does not usually occur in sewers. The effect of any given splashing in a drain is of extremely short duration, the bacteria subsiding with great rapidity, but air currents, produced by ventilation, may meanwhile have conveyed these bacteria for considerable distances along the drain or into ventilating shafts of the drain. On the other hand, owing to the

rarity of bacteria of sewage origin in sewer air, which has been repeatedly established, opportunity very rarely occurs for their convection by air currents, from sewer to house drain, in the absence of the intercepting trap; indeed, direct experiments show that the possibility of such convection is so small that its practical importance in relation to danger to health is infinitesimal. The bacteriological evidence undoubtedly indicates that the bacterial danger of sewer air is incomparably less than the bacterial danger of drain air, and that, therefore, the entry of sewer air into a house is of correspondingly smaller importance bacterially than the entry of drain air.

The foregoing evidence is confirmed by experiments on animals which show that while animals may be adversely affected by exposure to the concentrated effects of putrefying excrementitious substances, they are affected, either in their growth and nutrition or in their susceptibility to disease, by exposure to sewer air.

It is also confirmed by the general and epidemiological evidence, which is to the effect that human beings deliberately exposed to the effects of sewer air do not appear to be affected in health; that the association of the incidence of certain specific diseases, such as enteric fever and diphtheria, with drain defects which allow of the entry of sewer air as well as of drain air into houses, is almost identically the same as the association of similar defects with the absence of disease; and that the experience of districts without intercepting traps does not show that their absence has been harmful.

The necessity of the intercepting trap, on bacteriological or epidemiological grounds, has not, therefore, been established. It appears, in fact, that the characteristic of sewer air which is of practical importance is its smell, and that, therefore, the question as to the necessity or otherwise of the intercepting trap is narrowed down to the issue whether, in any given case, sewer air will be more perceptible or less perceptible to the sense of smell with or without the trap.

Nevertheless, the question is one of serious public health importance. Human beings vary greatly in their perception of smells, and offensive and unpleasant odors affect the comfort and physical well-being, and probably the health, of the individual. It is obviously most important that public health authorities should make every effort to be sure that both sewers and house drains are so designed and constructed that the opportunities of their contributing smell to the atmosphere shall be reduced in every possible way.

Exceptional Circumstances.

In ordinary cases the smell of sewer air is less perceptible, not more perceptible, when the intercepting trap is omitted, and chiefly, it would appear, because in the absence of the trap opportunity is afforded for sewer air to escape entirely at a height above the ground. But there are exceptional cases where the intercepting trap may be required, in order to prevent perceptible smell from the escape of sewer air from the tops of ventilating shafts of house drains. Sewage may be so offensive that the escape of sewer air, even at a height, is a perceptible nuisance, so much so that it may be necessary to close as many sewer ventilators as possible, whether at the ground level or at a height; house drains may be connected with cesspools, flat or storage sewers, or with sewers which are old and foul with deposit; houses may be built in terraces, one above the other, so that the ventilating shafts of the house drains of one terrace are at or about the level of the ground of another terrace, and so forth.

As circumstances in this respect will vary in different localities, the question whether, in order to prevent nuisance from smell in such exceptional cases, the intercepting trap is or is not required in any locality, or part of a locality, is one which will need to be considered and determined by the local authorities and their advisers in the light of local conditions. Where, however, the trap is considered to be necessary or desirable, the measure for providing against the effects of blocking of the trap should not be neglected—namely, the closure of the open channels in the inspection chamber giving access to the trap, and the construction with iron pipes of the main portion of the house drain, unless this is remote from the house.

Ventilation of Sewers.

The importance of the effect which the presence of the intercepting trap has on the ventilation of sewers, on which much stress has been laid, has probably been exaggerated. The free ventilation of sewers appears to be unnecessary either for the prevention of pressure of sewer air on traps or for the safety of sewer men, except in the case of sewers which are large enough to admit them. Even in such sewers, however, it is dangerous to rely on ventilation alone, and special precautions should always be taken. Moreover, it is exceedingly difficult to insure that sewers are freely ventilated, even when the most elaborate measures for this purpose are adopted. On the other hand, the prevention of nuisance from smell renders it necessary that any openings which may be deemed to be requisite for the ventilation of sewers should not be at the ground level.

The relationship between the splashing of sewage and the temporary presence of sewage microbes in drain air and the wafting of such microbes to considerable distances by currents of air, which has been established in the course of our inquiry, appears to be a matter of practical importance, whether the intercepting trap is present or not. The bacteriological evidence suggests that if exposure to drain air is related, as many suppose it is, to attacks of sore throat or other septic affections, the explanations may be found in the liability of drain air, unlike sewer air, to carry in suspension large numbers of microbes of sewage origin. It is desirable, therefore, that the possibility of splashing should be taken into account in the construction of drains, in order that it may be reduced to a minimum. It is likewise important, whether the intercepting trap is present or absent, that the tops of soil pipes and of the ventilating shafts of house drains should be as remote as possible from windows, not only with a view of avoiding smell, but also of minimizing the chance of sewage microbes, which may be present in drain air, being blown into the house through the windows.

MONTREAL.

Montreal, Jan. 29.—The cold weather is brightening up the plumbing trade here, and business is taking on a brighter tone. There is still a great shortage of radiators, and there is no relief in sight yet.

Soil Pipe.—There is no change in the prices from our last quotation, which was 65 per cent. off list price. The demand is brisk.

Soil pipe fittings are selling at 70 to 70 and 5 off list.

Lead waste pipe remains unchanged.

Wrought iron pipe in black quoted as follows:

3 in. pipe	\$19.47 per 100 feet.
2½ in. pipe	14.83 per 100 feet.
2 in. pipe	9.30 per 100 feet.
1½ in. pipe	6.97 per 100 feet.
1¼ in. pipe	5.80 per 100 feet.
1 in. pipe	4.27 per 100 feet.
¾ in. pipe	2.97 per 100 feet.
½ in. pipe	2.57 per 100 feet.
¾ in. pipe	2.00 per 100 feet.

Galvanized wrought iron pipe is selling at:

2 in. galvanized pipe	\$12.80 per 100 ft.
1½ in. galvanized pipe	9.60 per 100 ft.
1¼ in. galvanized pipe	7.95 per 100 ft.
1 in. galvanized pipe	5.87 per 100 ft.
¾ in. galvanized pipe	4.10 per 100 ft.
½ in. galvanized pipe	3.40 per 100 ft.

Boilers and Radiators.—There is a great shortage in these lines, and manufacturers are still busy endeavoring to

fill last year's orders. With their foundries working to their fullest capacity it is impossible to keep up with the demand.

Zinc sheets will in all probability advance very shortly.

THE DEVELOPMENT OF THE SWITCH DAMPER.

(Continued from page 15.)

was not unusual to find air ducts so filled with dust that they became ideal breeding places for vermin, whose tracks were not only in the form of footprints, but often stomach prints showed, as the dust was so deep. The latter condition was observed in one of the New York City hospitals.

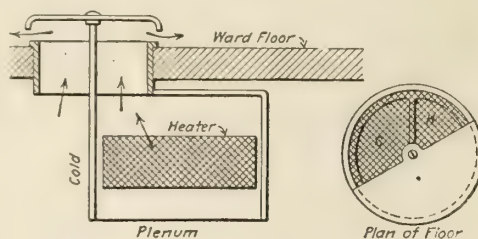


Fig. 10.—A "mixing mushroom" head, Moses Taylor Hospital, Scranton, Pa. (1882).

Revolving cap under bed, half perforated, half solid, revolved by foot.

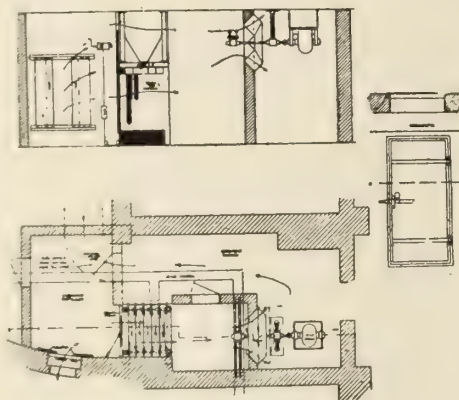


Fig. 11.—Ventilating apparatus in New War College at Washington.

Shutter moves up or down admitting cold air at bottom and warm air at top, two currents being mixed by fan.

ZONE SYSTEM IN PARCELS POST EXPLAINED.

(Continued from page 9.)

One regulation in the Parcel Post legislation in the United States prohibits all packages that measure more than 6 feet in length and width combined. Special postage stamps have been provided in denominations from 1 cent to \$1.

A parcel on which the postage is

fully prepaid may be insured against loss in an amount equivalent to its actual value, but not to exceed \$50 on payment of a fee of 10 cents in parcel post stamps, such stamps to be affixed.

There are, of course, a great many details in connection with the operation of the system about which it is not necessary to go into here. The above represents concisely what it is. If the system remained as it is, the retailer would probably not find it very disastrous to his business, but already there is an agitation, presumably from the mail order houses, to eliminate the zone plan and to have substituted the flat rate method of parcel assessment. As it is at present the system may be found to be top heavy. That is what the United States trade have to fear. It is quite possible that later on the flat rate plan will be the system in vogue. The tendency would be the same in Canada, and that is why the Canadian trade should oppose Parcel Post in any form.

WANT SANITARY INSPECTOR.

Galt, Ont.—The first meeting of the newly organized Board of Health, held last night in the Council Chamber, was made important because of the urgent recommendation to the Town Council to appoint a Sanitary Inspector who will give all his time to the duties of the office. For many years the work has been in the hands of the Police Department and one of the constables has been deputed to do what was absolutely necessary.

LENGTH OF TIME REQUIRED TO TEST GAS WORK.

Editor Plumber and Steamfitter.—When the pipes are all run and must be tested how long should the test be left on in order to be sure that the work is all right? L.

In some places the regulations call for a test of 30 min., and in others the test must be maintained for an hour. We believe that a pressure of ten pounds (or 20") should be maintained for an hour's time. If a gas job will hold up for that time and at that pressure it should, 99 times out of 100 make good always.—

Markdale, Ont.—Mr. Arthur Jones, plumber of Owen Sound, has a position with W. S. Perkins.

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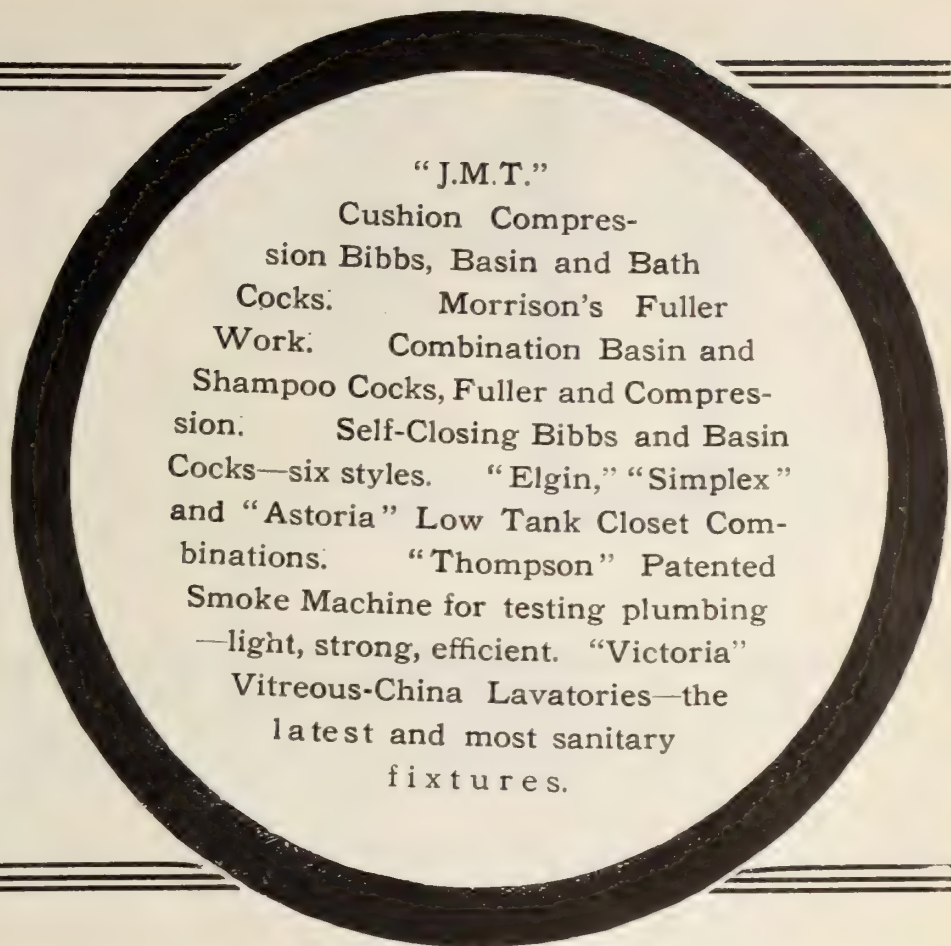
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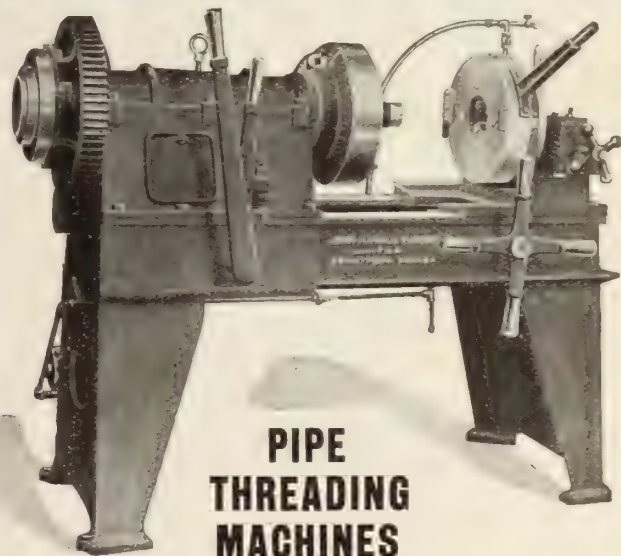


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See Sweet's Index, Pages 1139, 1140, 1141.



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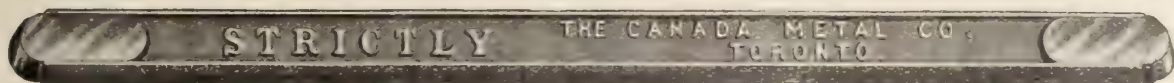
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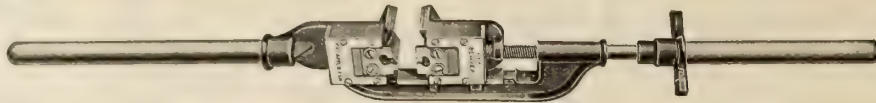
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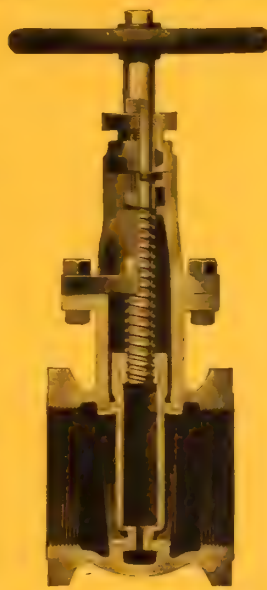
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Vol. VII.

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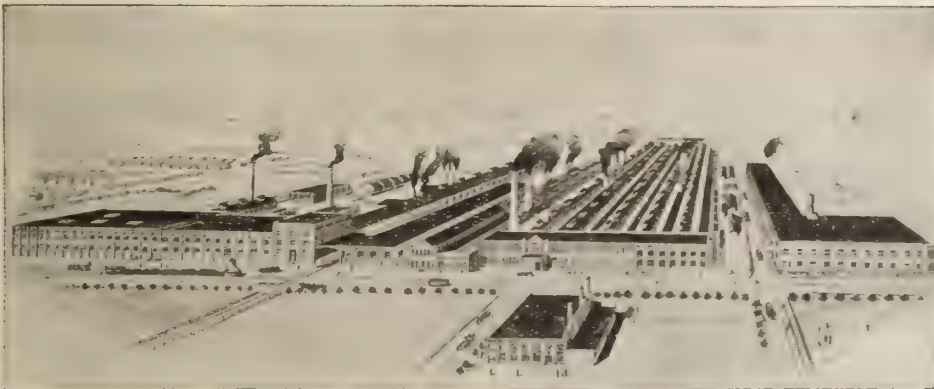
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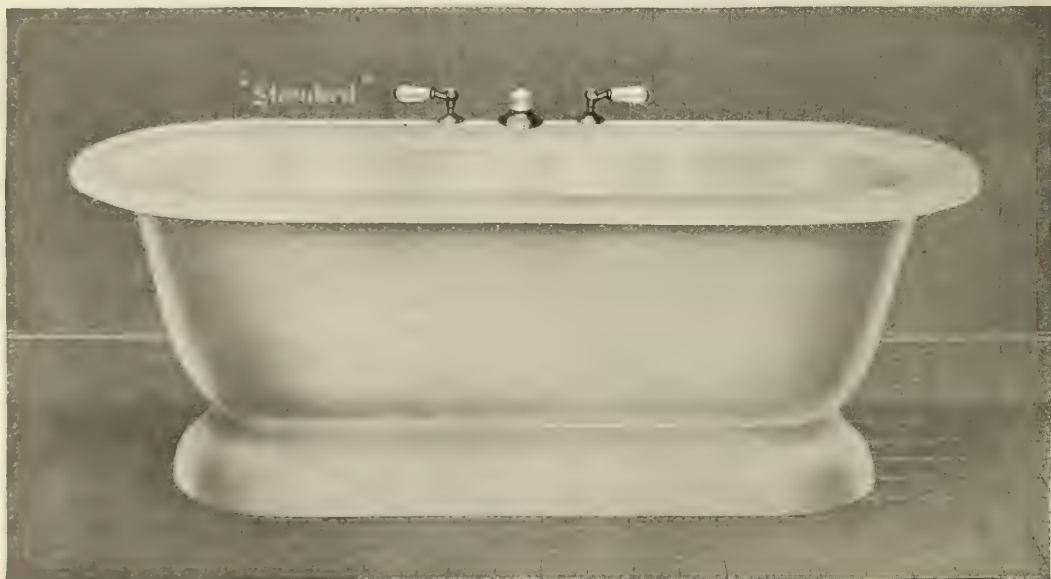
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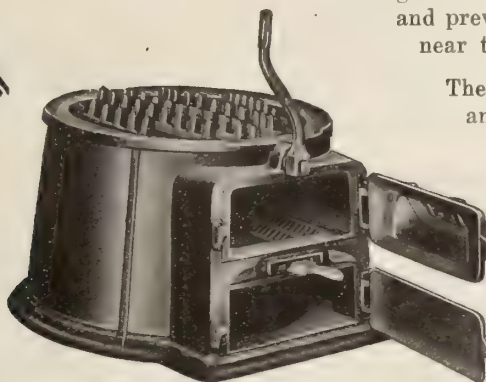
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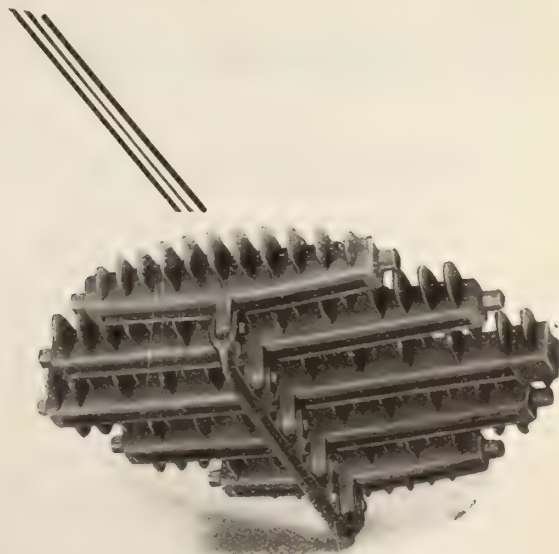
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SHOWING ASH SIFTER AND GRATE**

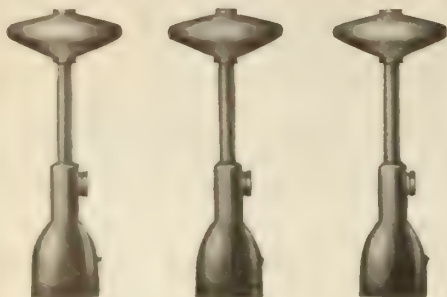


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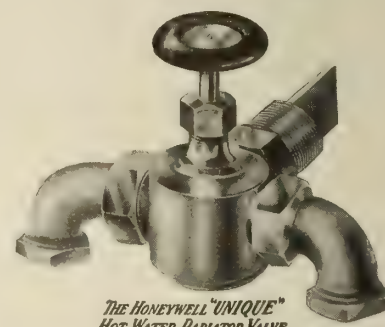
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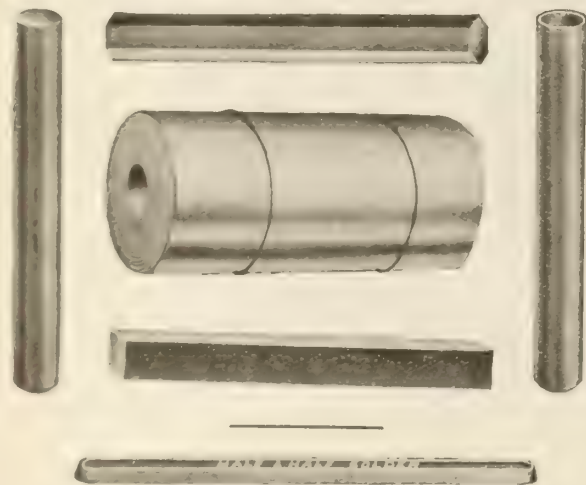
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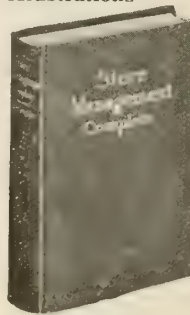
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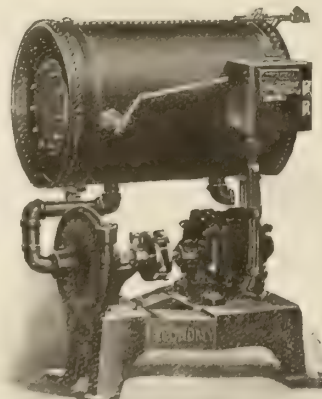
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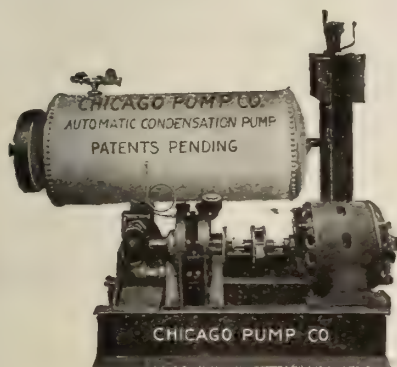


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"KING" Round Water Boiler.
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Prompt Shipment Guaranteed

SEE Sectional View of 36"
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Heating Surfaces

NOTE the **Arched Fire Chamber** and greater **over hanging** heating surfaces, than any other cast iron boiler on the market.

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OBSERVE the **Triple Fire Travel** on **both sides** of boiler, also the **cross fire channels** between each section.

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London Local Society Hold Annual Dinner

London Sanitary Engineers Foregather and Spend Jolly Evening—President, A. E. Gibbons, and Secretary, E. H. Russell Received Presentations from Committee for Valuable Services Rendered—Reminiscences of Fifty Years Ago by R. J. Haslett

The London Society of Domestic, Sanitary and Heating Engineers held their Annual Dinner at the Travellers' Club, London, on January 16, 1913. B. Noble was chairman of the social committee and much credit is due to him for the excellent entertainment provided. In recognition of his splendid services, as president, during the past year the committee presented A. E. Gibbons with a fine cabinet of silver. The presentation was made on behalf of the committee by John Eggett, who has always been a very active member

in the society. In thanking the members for their kindness Mr. Gibbons expressed the hope that the coming years of the society would pass along as smoothly and amicably as the past year had done. Following the presentation to the President, J. R. Haslett on behalf of the committee made a presentation to E. H. Russell, secretary of the committee. During the course of the evening speeches were made by several of the members present. Mr. Haslett in a very free and easy manner gave an outline of his work with classes in

the Technical school. R. J. Haslett, who has now retired from the plumbing profession after some fifty years of active service, spoke briefly on the value of sociability and good-fellowship amongst the different members of the society. A very interesting part of his address was formed from reminiscences of old association days, and the changes which have taken place in the last fifty years.

Altogether one of the most enjoyable evenings the society has ever had was spent on this occasion.



Committee of London Society of Domestic, Sanitary and Heating Engineers. At the head president A. E. Gibbons, on his right R. J. Haslett, B. Noble, C. F. Needham, H. S. Laughton and J. R. Haslett. On the left of the president E. H. Russell, John Eggett, Herb Widden and Wm. Skelly, Jr.

Calgary Association Hold Annual Meeting

Annual Report Shows Association in Flourishing Condition—New Officers Elected for 1913—An Effort Made to Strengthen the Provincial Association—Representation on All Boards Connected with Craft a Necessity.

Calgary, Alta.—The fourth Annual Meeting of the Calgary Association of Sanitary and Heating Engineers, was held on Tuesday, January 29th, in the offices of the Association, 27-28 Mackie Block.

The reports for the year just concluded, show that the Association is in a flourishing condition, and that the year 1912 has surpassed all previous records in Calgary in the amount of building done, and in sanitary and heating installations.

The Association were under a somewhat heavy expense during the year, the National Convention being accountable for this; but the members felt that the great good that is bound to result from these National Conventions is worth every effort, and the far reaching effects of such gatherings more than compensates for the time and energy expended in making them successful.

It was hoped that at some future time, Calgary would again have the pleasure of entertaining the members of the sanitary and heating professions, and that when they came again, they would find the whole West united in their endeavours to better conditions along these lines.

At the conclusion of the reports, the annual election of officers took place, with the following results: President, James Marr, sen., of the Marr Plumbing and Heating Co.; vice-president, E. L. Martin, of E. L. Martin, Sanitary and Heating Eng.; secretary, J. H. Hillier, of Messrs. Campbell & Hillier; trustees, A. C. Grant, of Grant Bros., Limited, and C. E. Good, of Messrs. Good & Lepper. Chairmen of standing committees, sanitary committee, J. H. Hillier, of Messrs. Campbell & Hillier; heating committee, R. J. Priestly, of the Wm. Head Co., Limited; arbitration committee, J. B. Rogers, of J. B. Rogers, Sanitary & Heating Eng'r; auditing committee, Messrs. Jas. Marr, jr., of the Marr P. & H. Co. and H. C. Phelps, of Phelps Bros.; legislative committee, A. Desmarchais, of the E. J. Young Plumbing Co., Limited; apprentice committee, L. M. Phelps, of Messrs. Phelps Bros.; conference committee, J. B. Rogers, of J. B. Rogers, Sanitary & Heating Eng'r.

At the conclusion of the election of officers, Mr. Marr the new President was escorted to the chair, and a most cordial vote of thanks was extended to the retiring President, E. J. Young, for his services to the association, during the year 1912 in which he was the president.

The regular business of the association was then taken up and any matters of great importance to the trade during this coming year were dealt with.

One of these was the getting together of the members of the profession throughout the Province in an effort to make the Provincial Association a strong and enduring body. The Provincial Association is formed, but a policy of aggression on the part of the locals now affiliated with it, would make it much stronger, and the benefits to be derived are (especially in a new country) too obvious to be missed.

The projected convention of Western Plumbing Inspectors which will probably be some time in April, and at which it is the intention to have representatives from the Sanitary Associations, will also receive support from the Calgary Engineers, and when the time comes, a delegate or two from this association will be on the spot.

An effort was made by the association to have one of its members appointed on the local Board of Health, but the application for such an appointment was made too late, and the association will have to wait for another time.

It was felt by the members that the representation on all boards connected in any way with our craft was a necessity, in order to assist in the movement to better conditions, and the association has through its members, been taking an active part in the local Builders' Exchange. Jas. Marr and R. J. Priestly being elected first and second vice-presidents respectively at the annual election of officers of the Calgary Builders Exchange.

The National Convention of Builders Exchanges will be held in Calgary February 19th and 20th, and every effort will be put forth by the members of the Calgary A.S. & H.E. to assist the local exchange in making the convention a success.

The arrangement with the Local Union of Plumbers and Steamfitters expires this year, and a draft of a new agreement was submitted to the association by the union. An increase of wages was asked for and several changes in the existing clauses. This was referred to a special committee who were instructed to consider same and report at the next regular meeting.

NEW OFFICERS APPOINTED.

At the last regular meeting of the

International Association of Steam, Hot Water, and Power Fitters, Local 78, the main business of the evening consisted in the election of new officers for 1913. Those elected are as follows: President, E. Lawson; vice-pres., J. Flavey; recording secretary, F. Black; financial secretary, J. Martin; treasurer, T. Ward; inspector, J. Domelle; guard, T. Patterson; trustees, George McCarthy, T. W. Fullan and M. Quinlan; helper's secretary, D. McGraw.

After having appointed the new officers the members of the society adjourned to the large banquet hall where they were entertained to a supper and concert. During the course of the evening a very interesting address was given by M. A. Garrett, general organizer, who urged upon the members the importance of thorough organization. This, he said, was of supreme importance for their own protection as well as for the trade, and tended strongly to produce a better class of mechanics.



FIRES CAUSED BY STEAM PIPES EXPLAINED.

The following taken from the Toronto Star is a very probable solution for the way in which fires may be caused through steam or hot water pipes, and shows the necessity of taking every precaution in the installation of heating systems. Neither ordinary live steam nor "superheated" steam will heat a pipe, thick and strong enough to convey it, to a degree sufficient to produce a fire on wood, however dry. It will not even set charcoal aglow or in a blaze. But dry charcoal, when the heat is removed from it, being nearly pure carbon, will absorb oxygen from the air under favorable conditions, so rapidly as to produce active combustion—that is, a glow or blaze. The process of the origin of a fire from a steam pipe is: The heat from a steam pipe will, in the course of time, char, or, as the chemists say, carbonize, wood in contact or close to it. When this process extends to any depth in the wood it presents a surface full of fissures and cracks, thus exposing a large section to the action of the air. This process of charring drives the oxygen out of the charred portion and keeps it out while the heat is kept up. When the heat is removed the charcoal reabsorbs oxygen from the air, and if this action is rapid enough in a dry atmosphere, combustion is the result.

Annual "At-Home" Proved a Huge Success

Toronto Society Give Excellent Social Evening—Record Number Present —
Supply Houses Well Represented—Evening Proved One of the Most Successful
on Record.

The Annual "At Home" given by the Toronto Society of Domestic Sanitary and Heating Engineers on Friday night Jan. 31, in Forester' Hall was one of the best, if not the very best events ever held by the Society. Members who still retain pleasing recollections of previous social events, declare that in point of enjoyment and general interest it has surpassed anything attempted in the past. The "At Home" was largely attended, fully 300 being present. The music was excellent and the supper likewise. Nothing was lacking to make the evening thoroughly enjoyable and the time sped only too rapidly. The following artists took part in the programme: Miss Annie Taite, soprano; E. Jules Brazill, entertainer; James Feddes, tenor. The selections rendered were excellent and were enjoyed to the utmost by all present. The handsome ball rooms had been suitably decorated for the occasion and presented a most pleasing appearance. Music was supplied by Beares Orchestra, and dancing was continued until a late hour. The card rooms were well filled during the evening and a very pleasant time was spent by those interested in the games. Supper was served at 11.30 in the dining rooms on the floor below. The tables were prettily decorated, and a good menu had been provided to which fullest justice was done.

Many manufacturing firms and supply houses were represented among the list being B. O. T. Mfg. Co.; Toronto Hardware Co.; Taylor Forbes Co.; Steel and Radiation Co.; Warden King Co.; Anthes Foundry Co.; Monarch Brass Co.; Colwell Lead Co.; United Brass & Lead; Standard Sanitary Co.; W. A. Porter & Co.; Canada Pipe & Steel Co.; Plumber and Steamfitter; Remington T. Co.; Canadian Steam Pump & Machine; Dillen Co.; Dart Union Co.; Champion and Monitor; and others.

Among the representatives were:—R. J. Cluff, T. K. Dobie, A. G. Downs, A. E. Quinn, Geo. Qua, W. J. Callow, W. J. Spence, A. H. Arnold, Archie Melhuish, H. M. Dunn, T. M. Thomas, S. E. MacDonald, Jno. H. Inc, E. I. Chatterson, Wm. Parker, J. S. Kilpatrick, L. D. McKellar, F. S. Quinn, F. H. Webb, L. L. Anthes, J. Sherlock, G. D. Davis. Mayor Hocken was unavoidably absent, and was represented by A. E. Burgess.

The function was ably conducted and much credit is due the committee in charge, composed of the following members of the society. Chairman N. Blum-

bergh; Seey.-Treas., T. B. Smyth; Musical Director, A. Melhuish; Floor Manager, J. E. Fullerton; Asst. Floor Manager, F. Gentle; Chairman Reception Committee, J. Bloomer; F. Maxwell, A. F. Passmore, J. Wright, E. T. Needham, W. Schubz, G. Cooper, G. F. Frankland. The officers of the society for 1913 are: Pres., H. G. Waterman; Vice-Pres., J. T. Aggeth; Treas., F. Maxwell; Seey., J. E. Fullerton. Executive Committee, F. Maxwell, G. Clapperton, R. Yeomans, L. Legrow, E. T. Needham, N. Blumbergh, W. Mansell, H. Hicks, P. J. Hayes, J. Wright, G. F. Frankland, D. Glynn.

Among the visitors were noticed, C. H. Perry, Sr., and C. H. Perry, Jr., Pt. Hope, H. Robertson, Orillia.

TORONTO.

Toronto, Feb. 15.—Manufacturers and jobbers report trade during the past couple of weeks as especially good for season. This is true, particularly in iron pipe and soil pipe. In soil pipe all possible supplies up until March 31 are already covered by orders, and plumbers wishing to secure even small quantities are held up by shortage. Thirty-gallon boilers have recently been advanced 25c in Hamilton, but locally there has been no change. Since last writing lead waste and lead pipe have declined locally, discounts now being 10 per cent.

Soil Pipe.—Soil pipe continues very scarce, and in all sizes is practically unobtainable. Supply houses and manufacturers are booked to utmost capacity right up to the end of March. Any plumber wishing supplies, and who is in a position to buy, should look after placing his order now.

Iron Pipe and Fittings.—Supplies in iron pipe are much better than a few weeks ago, and now pipe is fairly plentiful. Demand keeps very heavy, however, for season, and the general tone of the market is strong. No change in price, either of piping or fittings, has recently taken place.

Enamelware.—There is a tendency on the part of the general public to purchase better quality enamelware, and the old idea of buying cheap goods is rapidly dying out. One supply house this week stated: "Business is very brisk and better than it has ever been at this season. All lines are beginning to move out rapidly." The market is

very strong, and changes, if any, will be in an upward direction.

Boilers and Radiators.—Cold weather has to some extent checked building and caused an easing off in demand for these lines. Some lines of radiators are still very scarce, and manufacturers are working mills to utmost capacity to get ahead of orders. Prices continue very firm, but unchanged.

Metals.—No very great change is noted in the metal market. Decline of 1c per lb. a week ago in tin has somewhat stimulated buying. The drop was the result of manipulation, and tin is now in same position as three weeks ago. Great scarcity still prevails in iron and steel products, and manufacturers who require these are having difficulty in securing supplies. Mills are booked up well into July. Lead and copper markets remain quiet, with little buying and no price changes.

Solder.—Cold weather of the past two weeks has caused much bursting of pipes, resulting in increased demand for solder from all quarters. Prices remain same as at last writing.

Lead Pipe.—All lead waste and lead pipe has recently taken a decline, discount now being 15 per cent. instead of 10 per cent. General tone of the market is one of dullness.

Boilers.—Thirty-gallon boilers have recently been advanced 25 cents in Hamilton, and are now quoted at \$4.75. This advance is due directly to goods being shipped prepaid to Hamilton. Locally there is no change in price.

OPEN UP NEW BRANCH.

The H. W. Johns-Manville Co., of New York, manufacturers of asbestos products and plumbing and lighting specialties have within the past few weeks opened up a new branch office in Salt Lake City, Utah. The company reports a very marked increase in business in that section of the country and have taken this step to facilitate the handling of correspondence, and orders from their customers there.

The H. W. Johns-Manville Co. has also announced the removal of their Newark office and saleroom to 239 Halsey St. This location is much more central and with a floor area of 4,000 square feet ample space is afforded for the display of all J.-M. products.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and
Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, To onto Atabek, London, Eng.

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Boards of Health, Architects, etc.

TORONTO, FEBRUARY 15, 1913

The Apprentice Question

So important does apprentice system appear to the master plumbers throughout the Dominion that several of the association are beginning to consider the question. One of the greatest difficulties in the past has always been that the average apprentice is continually looking for the boss plumber who will take him on and give him a cent or two per hour more than the boss under whom he has been working. This system has developed to such an extent that it has become a custom by no means uncommon with boss plumbers to offer a few cents more to journeymen in order to coax them away from rival establishments at times when men are scarce.

A great problem in connection with the apprentice system is the breaking in of young unsophisticated lads. So many of the boss plumbers are unwilling to spend their time and patience introducing beginners to the mysteries of the trade that the bulk of this work is left to those willing to put themselves to a little extra trouble. "The system" as one master plumber expressed it lately, "is along without the journeymen, and those who are unwilling to train apprentices themselves, being forced to get a helper of some kind generally employ a man who has picked up a few of the rudiments of the trade, but who is practically ignorant of the profession when a thorough knowledge is required. Under such masters, the helper makes little progress and the result is a general depreciation of skill throughout the trade." While that may be putting matters just a little bit strong, still there is much truth in the statement and the only remedy to the situation seems to be for all boss plumbers to start in their own apprentices, take an interest in their progress, and see that they serve a thorough apprenticeship,

and acquire complete knowledge and skill in all lines.



The Ontario Convention

The Annual Convention of the Ontario Society of Domestic Sanitary and Heating Engineers will be held in Toronto on March 20, 21 and 22. March 20 will be devoted to the meeting of the Executive Committee made up of the Chairmen of the various committees. In the evening all delegates will be entertained by the Toronto local society, at their second business supper. This evening is commonly known as Irish night and all delegates can depend on the Irishmen doing full justice to their visitors by providing an evening of splendid entertainment. The regular annual meeting will be held on Friday when all business of the society will be discussed. One of the most important features in the business meeting will be the discussion of a full schedule of retail prices. This schedule has been compiled by the Toronto society and through the directors of the Ontario body will be laid before the members to meet with the approval or disapproval of that body. Members of the Toronto society are quite anxious to see this matter pushed through and a standard retail price placed on all plumbing goods throughout Ontario.

Definite plans for Friday evening's entertainment have not yet been arranged, but it is expected that entertainment will be provided by the manufacturers and supply houses.

For March 22 a joint meeting of representatives from all the manufacturers and supply houses and members of the society has been proposed.

Tips for Helpers---By "Phoenix"

MORE ON A NEGLECTED ART.

In a previous article the writer gave some pointers on the subject of drawing. Not very much was said other than to advise the apprentice to get next to drawing a good clear straight line.

It is not to be supposed that the apprentice will become a master in art,

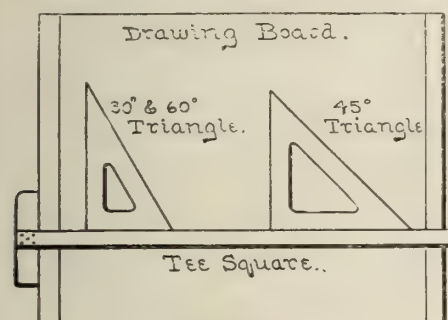


Fig. 2.

nor is it necessary, as mechanical drawing will be about the limit required.

If you have a room or any place set aside where you can study, about the first thing necessary is to have a good table or desk upon which to draw. Having this, it may not be necessary to place the papers, pencils and books away each time when finished. In Figure 1 there is shown a very good desk that one apprentice made for himself, and which answered the purpose very nicely for the two years that he used it.

It will be noticed that the leaf for use is 20 inches wide. It might be found that for large drawings this would be rather small and a 24-inch leaf would be better. At the point where the star is shown a hinge might be used, thus enabling one to let down the leaf when desired.

The height of the desk could also be regulated by having a series of holes so that the desk could be adjusted when desired. If electric light were available no lamp bracket would be necessary. A small quarter-inch moulding at the point where the six-inch piece joins the 20-inch piece would prevent the pencils and pens from rolling over the drawings.

Having constructed a desk or stand upon which to draw (and by the way make it five feet in length, if possible), the apprentice is in shape to begin to use the tools. One of the guides on this question recommends a drawing board,

tee square and triangles, as shown in Figure 2.

Even the slight dexterity gained by being able to draw a straight line with a pencil is of use. On a certain job for which the writer once applied several years ago the boss said: "Here is a church that I have got to run the mains in next week. Take these plans and put in the mains. Let's see just how you would do it."

It happened that I had gone through a course in drawing and was able to draw the mains in on the prints in good shape in a short time. Another fellow who had tried just the day before failed to do the task and did not land, although he was a good fitter, as such fitters go.

In a certain examination, held not so long ago, about nine out of ten of the journeymen fell down when it came to drawing their ideas on paper. In many of the cities the applicant for a license is now required to pass a written examination, and some of the questions require some knowledge of drawing, and as time passes the written examination will be made more and more exacting. At present in some cases these examinations are little better than a farce, and if they were more severe about two-

any stationery store for a moderate price. When entering the subject it is just as well to have the tools to do the work with. One would not expect to do a very complete heating or plumbing job with half a "kit."

Now as to how to obtain the necessary instruction. There are at least three different ways in which to proceed in order to get definite results.

The first is to get some plans from the shop and copy them. This is all right as far as it goes, but it does not go far enough. One would have to be born with a great deal of originality in order to make much progress.

The second method is to join some night school where drawing is taught. This will be well and complete if the apprentice can find the time to do it.

The third method is to purchase a good text book that is especially prepared for steamfitters and plumbers and follow it through, going to some regular drawing teacher as difficulties are met with. Such a book might cost a day's wages. Another way would be to join some good correspondence school, there being at least two that are strictly first-class and which produce results. In any event, the apprentice will need

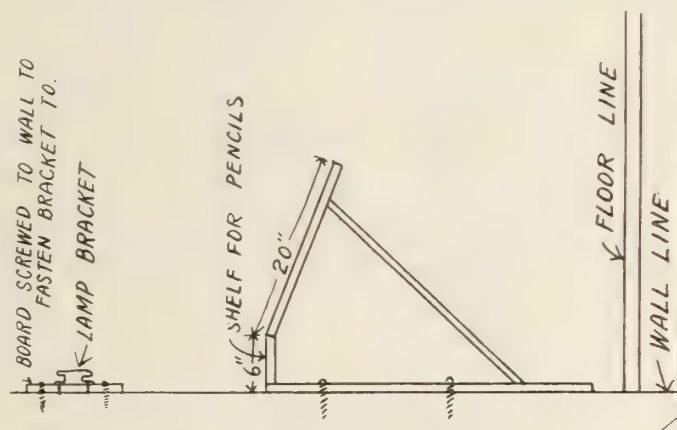


Fig. 1.

thirds of the journeymen would be put out of business.

Compasses, a couple of rules of different size, some pencils of different degree of hardness, some pens, a piece of art gum to clean the drawings after they have been inked, and the apprentice is ready to start.

A regular set of drawing instruments can generally be picked up at almost

plenty of persistence, but the end attained is well worth the sacrifice in time and trouble expended.



A despatch from Merritt, B.C., states that three plumbers are opening up in business there.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

HOT WATER DOES NOT REACH-ROOM.

Editor, Plumber and Steamfitter,—In the sketch submitted the hot water fails to come to either the tub or the lavatory in the bathroom, which is about fifty feet from the range boiler. Will you please give information as how to change and have it work?

T. R. Hughson.

In the sketch given the heavy line shows the job the way it now is and does not work. We would change and

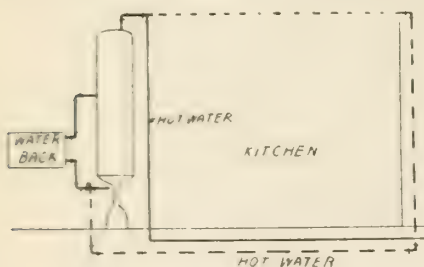


Fig. 1.

install after the manner represented by the dotted line shown in Figure 1.

D. C. H.

ADJUST THE HEAT TO THE CUSTOMER'S COMFORT.

Editor, Plumber and Steamfitter,—In a steam heating job that has been put in recently the owner complains that the house is "cold." I looked the plant over and found that it worked all right and that the thermometer registered 78 at the time the owner complained of the "cold." Can you suggest any reason for such a state of affairs? The owner was about 60 years old.

M. S. H.

We believe that you have forgotten that all human systems are not built on the same plan. Some people think a temperature of 65 is hot; others consider that 80 is none too warm. It depends upon the constitution of the individual, and he is certainly entitled to get what he pays for.

Again, the condition might have been produced from poor ventilation. If the house has double windows and the owner keeps it tightly closed (as is

probably the case) such a condition as you describe could be produced. If not, and the owner feels that a higher temperature is desirable, why, put in more radiation. With two radiators in each room there would not be much doubt but what the thermometer could be raised to 85, which should satisfy the party mentioned.

D. C. H.

DRILLING SOFT STONE WALLS.

Editor, Plumber and Steamfitter,—How can I drill small regular holes through soft stone? Tearing out the stone makes too big a hole, and it costs too much to stop them up again. X.

Take some good extra heavy steam pipe one size larger than the pipe you desire to run through the hole and file some teeth in one end of the pipe. Make short rather than long teeth, and set them so that they will cut a trifle larger hole than the exact size of pipe used. The drill should be from three to four feet in length. This drill can be used on a brick wall also.

D. C. H.

GETTING PIPES AROUND THE BEAMS.

Editor, Plumber and Steamfitter,—I have a steam job to put in and there are several large beams that interfere with the run of the mains. If I run the steam main below them it will bring it too low in the cellar. How can I get out of the difficulty?

Steam Mains.

In Figure 2 we show a very ingenious manner in which one steamfitter surmounted this very difficulty. We think, however, that he forgot in inserting the

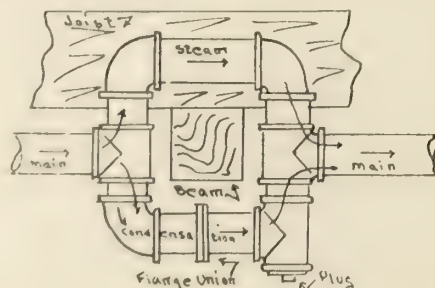


Fig. 2.

plug and at that point a pipe should be dropped into the return pipe to the boiler.

D. C. H.

USING THE FLUSHOMETER.

Editor, Plumber and Steamfitter,—Will you be kind enough to show a manner in which the flushometer can be set so that it cannot be tinkered with by every one who uses the toilet room?

Particular.

We show in Figure 3 the manner in which this is done in a certain large in-

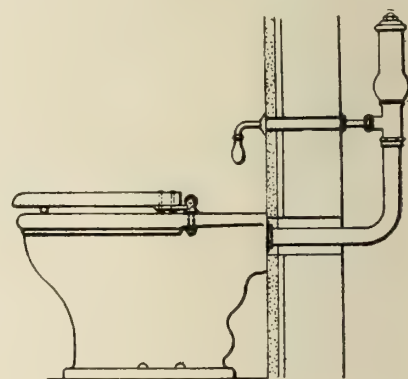


Fig. 3.

stallation where several hundred of these appliances are used. Set the flushometer on the other side of a partition and only the caretaker can have access to it.

D. C. H.

NUMBER OF HOURS PER DAY FOR THE APPRENTICE.

Editor, Plumber and Steamfitter,—Can you give me any idea of the number of hours a day that an apprentice should put in? I have been working in a shop where the owner asks me to get the horse to the shop the first thing in the morning and to put it out after the day's work is done. He also asks me to stay in the shop until he can go to supper and return. This makes it about seven in the evening before I can get home. Do you think that such a manner of treating an apprentice is a square deal?

Apprentice.

Generally speaking, we believe that it is not customary for an apprentice in

these days to put in the number of hours that the writer seems to indicate. In certain cases, such as a great rush of work or possibly on a Saturday, the owner might ask that the apprentice, in the absence of the regular driver, temporarily care for the horse. As to its being a regular occurrence or as to keeping shop while the owner gets his supper we believe that you are being imposed upon, and we should advise you to hunt up another shop where the owner is more considerate. You are supposed to be learning a trade and not to run a livery. D. C. H.

USING LARD OIL IN COLD

Editor, Plumber and Steamfitter,—What handy means can I take to prevent the lard oil from becoming thick in a building I am working in? There is no heat on and the oil soon becomes too thick to run. Fitter.

You can get a plumber's candle and set the oil can up on some bricks with the lighted candle underneath. Another way is to have a lantern lit and turned down low. One fitter used to heat a brick and set the oil can on same. Another we knew used a pan of hot water. D. C. H.

KIND OF PUTTY USED FOR SLATE STALLS.

Editor, Plumber and Steamfitter,—Will you please tell me the kind of putty that is used in pointing up the slate urinal stalls? H. E. B.

One kind that we have been told works successfully is what is called the slater's putty. This is mixed with oil, and is non-absorbent. It can generally be obtained at any store that carries a line of paints and oils or some hardware store.

The putty is somewhat pliable and will not fall out if the stalls are given a hard blow. D. C. H.

POINTS TO OBSERVE IN A SLOP SINK.

Editor, Plumber and Steamfitter,—Please tell me the necessary points to be considered regarding a good slop sink. S. E. Buell.

See that the size is suited to the use to which the sink will be put. It should not have any sharp angles, and should have a good-sized outlet and a coarse strainer. A flushing rim also adds to the cleanliness and ease in cleaning.

Both hot and cold water should be brought to this sink. Should it be necessary to place the sink against the wall, as is the case many times, a splash back large enough to prevent wetting the wall should be provided. Enameled ware is considered to provide a very good slop sink. D. C. H.

MANTLE BURNER VS. OPEN BURNER.

Editor, Plumber and Steamfitter,—Can you tell me how much more light a mantle gas burner will give than an open burner? Also how the two compare in the consumption of gas? S. X.

We have observed it stated that the mantle burner will give from four to six times as much light as the open burner. We have no figures handy as to the amount of gas that the mantle burner will save, but have our gas bills for information, and from comparison should say that it would be at least half. D. C. H.

HEATING A SMALL CHURCH.

Editor, Plumber and Steamfitter,—Please show me a good way to heat a small church by steam or hot water. J. J. C.

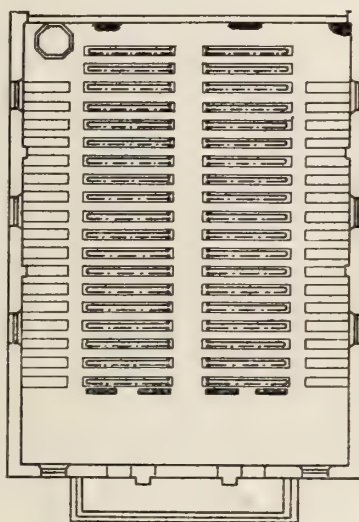


Fig. 4.

In Figure 4 we show how one steamfitter accomplished the point in question. It will be noticed that each pew in the body of the church is heated separately. This installation is said to have obtained good results. Radiators are installed at each end of the church. D. C. H.

USING PLENTY OF TRAPS ON HOUSE DRAIN.

Editor, Plumber and Steamfitter,—Would it not be policy to use two traps on the house sewer instead of the one generally used? John Summers.

We should not favor the idea. Any benefit from a trap that is used at this point would come from the depth of the trap's seal rather than the number of traps that were used. There would also be a dead air space between the two traps, which would not tend to improve the general conditions. Some sanitarians contend that there is no need of a trap at this point and back

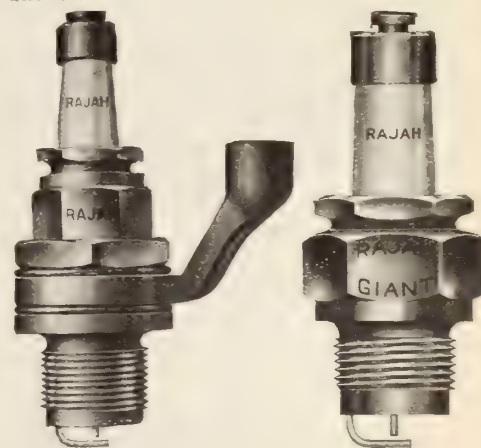
up their statement with good arguments. The matter will have to be threshed out for some time to come, as there are many differing conditions, and perhaps, at last, a condition can be established which will be fair to all. D. C. H.

RAJAH SPARK PLUGS.

The Rajah Auto Supply Co., Bloomfield, N.J., have added two new lines of Rajah spark plugs to their line for 1913. The self-starter Rajah Plug has a shoulder at the lower end upon which rests a yoke held by a jam nut, gaskets being used on each side of the yoke between the shoulder and jam nut to make an absolutely gas tight connection. The gas enters the cylinders through the yoke, following the channel grooved in the shell to the passage through the shell into the cylinder. The yoke on account of being adjustable, can be moved to the most convenient position for connection. The Rajah self-starter plug, in addition to the specially designed shell, has the patented knife edge bushing and standard porcelain with an extra long wire. All parts are interchangeable and broken parts may be replaced at small cost.

The Rajah Giant Plug is very simple in construction, not including a Rajah Clip Terminal which is supplied free of charge with every spark plug. There are only four parts, namely,—the imported porcelain, brass bushing, inside copper asbestos gasket, and the steel shell. The plug may be easily and quickly taken apart for cleaning which is a desirable feature.

The patented knife edge "Rajah" bushing and special copper asbestos gasket obviate the necessity for the double gasket.



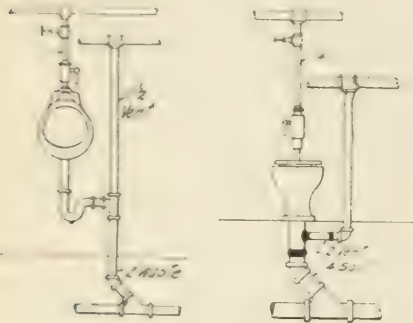
The "button top" feature of this plug adds greatly to its simplicity, as in connection with the Rajah Clip Terminal there is no necessity for Thumb Screws or other device.

With the exception of the imported porcelain and wire electrodes, all parts are made in the Rajah Auto Supply Co. factory.

Plumbing in Grand Central Station, New York

World's Greatest Railroad Terminal—Many Novel and Original Features Introduced—Plumbing on a Very Large Scale,

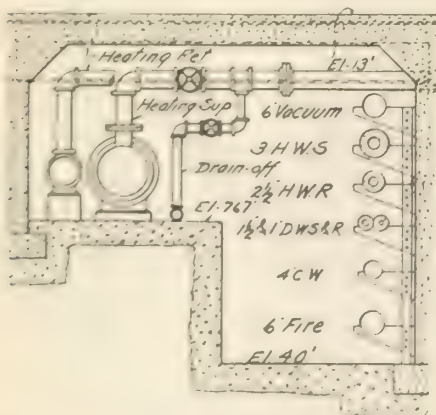
The new Grand Central Station, New York City, which has recently been completed, offers many new and original features of special interest to the modern sanitary engineer. As this is one of the greatest, if not the greatest, rail-



Details of the Urinal and Closet Connections, Supply, Drain and Vent Piping in the Grand Central Terminal.

road terminals in the world, and as many improvements not introduced in other terminals have here been employed a brief description of the plumbing should be of special interest.

Above elevation No 118 on the cold water line there is installed a by-pass connection of the same size as the riser, which connection is carried down to the suburban level and cross connected with the riser; similarly treated on the opposite side of the building. The reason for this is to install a booster pump for increasing the water pressure above ele-



Section of Pipe Tunnel under the New Grand Central Terminal.

vation No. 118, if found necessary in the future. Plug tees are also left at the bases of the risers to take the suction for the pumps.

In the furnishing of hot water to all

of the fixtures, it was required that provision should be made to heat this water most economically and circulate it to the numerous fixtures distributed over the great area of the terminal. For the heating of hot water there were installed two Wainwright corrugated tube domestic water heaters, each of which is guaranteed to be capable of heating water from an initial temperature of 50 degrees to a final temperature of 160 degrees, at the rate of 15,000 gallons per hour each, when supplied with sufficient steam under a pressure of 5 lbs. per square inch, corresponding to a temperature of 227 degrees. Each is fitted with automatic temperature control, and is constructed to withstand a working pressure of 250 lbs. per square inch and a test pressure of 300 lbs. per square inch in the water space when necessary.

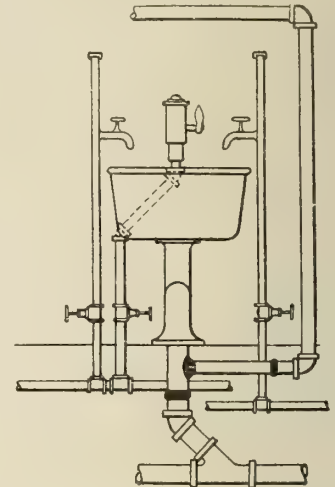
To circulate the water there were provided two motor-driven centrifugal pumping units, each consisting of a 4-in. Alberger two-stage centrifugal pump mounted on the same base plate with and direct connected by means of a suitable flexible coupling to a 200-volt, D. C., motor. Each of these units was provided with a controlling device to give a minimum speed of 900 r.p.m. and a maximum speed of 1,800 r.p.m. When operating under the maximum conditions, each of these pumping units is guaranteed to be capable of circulating water at the rate of 250 gallons per minute, against a total pipe friction head of 75 feet of water. Each of the pumps is also capable of withstanding a static pressure of 250 lbs. per square inch. Both of these pumping units are provided with bronze impellers, bronze diffusion rings and bronze covered shafts, suitable for hot water service.

The water is circulated through the heaters, around the system and back again to the suction of the pumps, making a closed system. The water is drawn off for the fixtures at various points in the circuit. The hot water circuit, therefore, is practically a closed one, and the pumping units are required to overcome the frictional resistance to the circulating piping only.

The accompanying cut shows one of the Wainwright heaters installed directly over the two motor-driven circulating pumps.

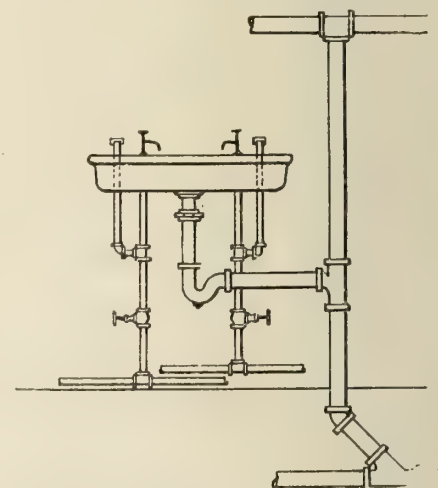
The cast iron pipes and fittings are extra heavy. The following weights only were accepted:—2-in. pipe—5½ lbs. per ft.; 3-in.—9½; 4-in.—13; 5-in.—17; 6-in.—20; 8-in.—33½; 10-in.—

45, and 12-in.—54. All this pipe is galvanized full weight, genuine wrought iron pipe, of standard and extra heavy weight, according to pressures carried.



Typical Connections for Slop Sinks in the Grand Central Terminal.

All fittings above 2 in. in size are standard or extra heavy weight cast iron, according to weight of pipe and expansion required. All 2 in. and below are malleable. Brass pipe is seamless drawn tubing of iron pipe size and gauge and is thoroughly annealed. Brass fittings are of extra heavy castings, iron size and correspond with pipe in quality



Lavatory Connections as used throughout the Terminal Institution.

and finish. All exposed brass plate is heavily nickel-plated.

The general requirements for all valves on this job were as follows: Full opening, straightway gate valves were

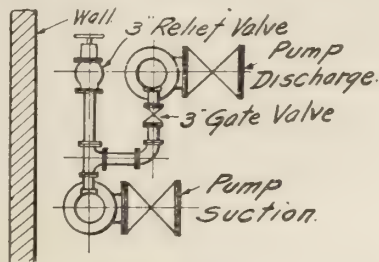
PLUMBER AND STEAMFITTER

used for all water service from and including 1½-in. and up. Globe or angle globe valves were used for all services including 1-in. and less. All valves 2½-in. and smaller have brass body and brass seats, finished trimmings with screwed ends. All valves from 2½-in. and larger are heavy iron body with bronze mountings, approved metal seats and screwed ends. All valves from 4-in. up have outside screw yoke, and over 8-in. valved by-pass, with flanged ends. Valves where exposed and used in connection with nickel-plated or brass pipe are of the same finish as the pipe. The rule for installing all valves is that no branch pipe leaves its main without a valve, and where hot water is to be kept in circulation, check valves are installed to maintain a continuous flow in one direction, insured by circulating pump. All fixtures have controlling valves.

All the hot water and circulating piping is covered with non-heat conducting

covering, canvas wrapped and banded with solid brass bands.

The rain leader system is of screw pipe and fittings, the same as called for under the heading of wrought iron pipe.

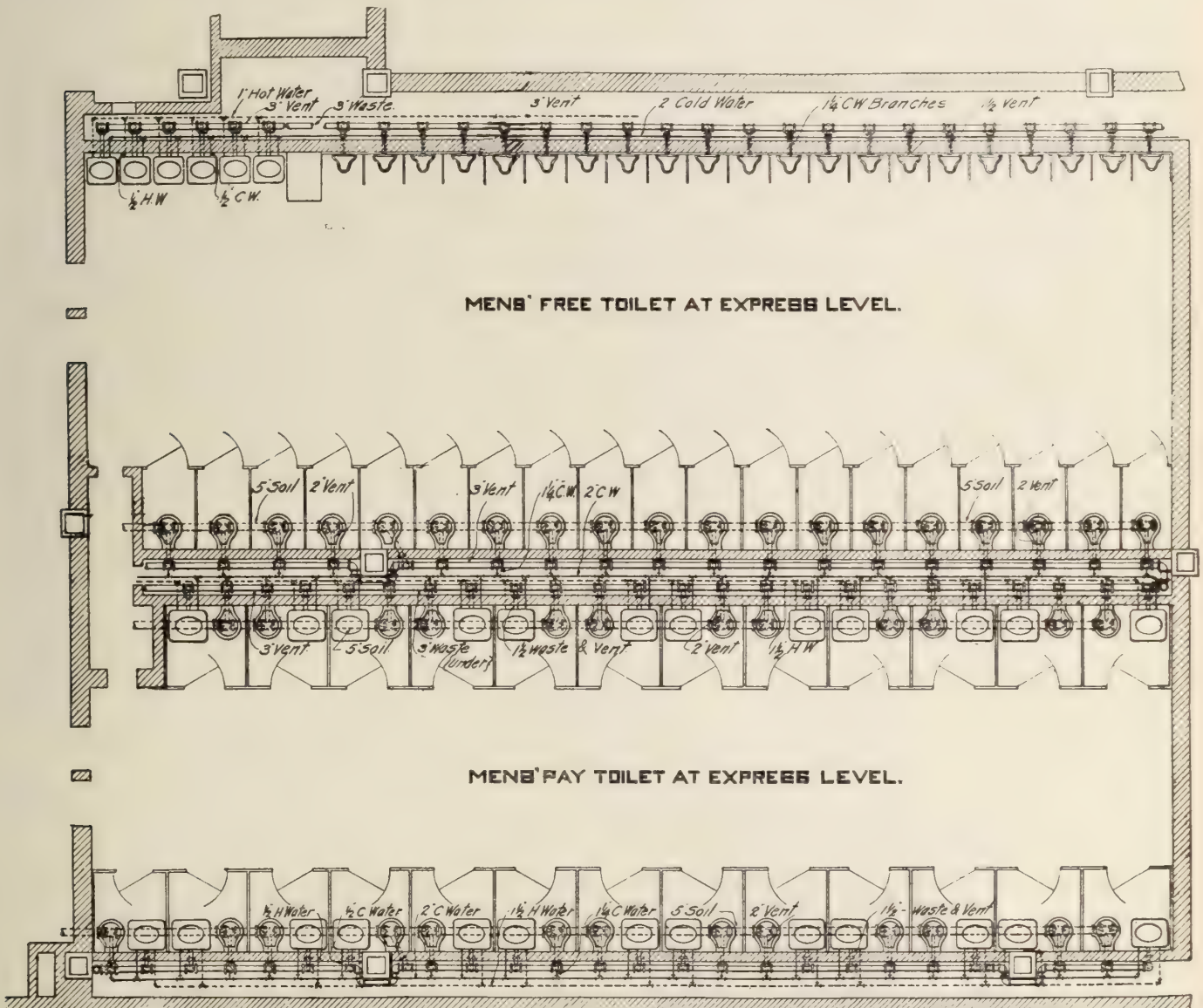


Detail of 3-in. By-pass on Elevator
Service, Grand Central Station.

In general, the leaders are on the outside walls of the building and are brought down and carried into the 46th or 42nd street sewer system, all as shown on the leader riser diagram on the next page.

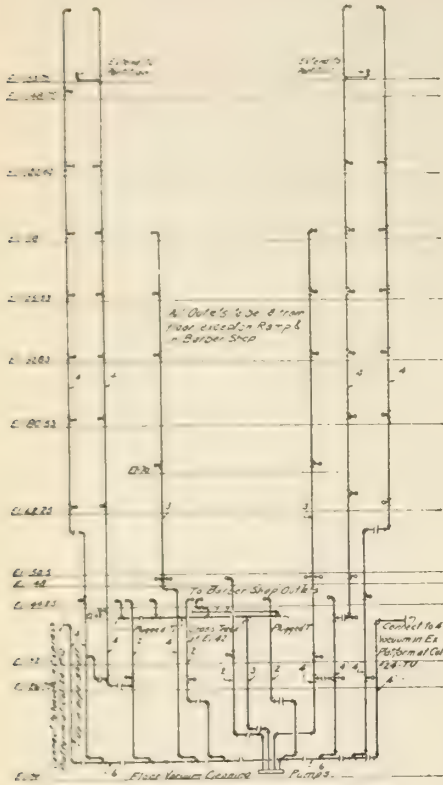
The fire protection system has two 6-in. valve connections to the fire line main in the 43rd street subway for the main part of the building, thence round under the suburban platform and cross connected with 6-in. main. From this main there are two 6-in risers in the south east corners of the main part of the building and up to the roof in the nearest stairways. Two 6-in. risers are run from the fire main in 43rd street subway in the northern part of the building, making four 6-in risers to the roof with valve hose connections; hose and rack installed on every floor on each riser.

There are a number of short stand-pipe connections by valves to the same 43rd street main and extended from this line platform to the stub end of the tracks and suburban levels, it being the intention to have a fire hose connection at or near the ends of the platforms. There are 95 outlets, exclusive of the 300 in yard.



Plan of Men's Toilets, showing Piping Connections in the New Terminal of the New York Central Railroad, New York City

There are Siamese connections as shown on the fire riser diagram, the entire work conforming with the rules



Risers for the Vacuum Cleaning System
in the New Terminal just completed.
in New York City.

and regulations of the Fire Department
of New York City.

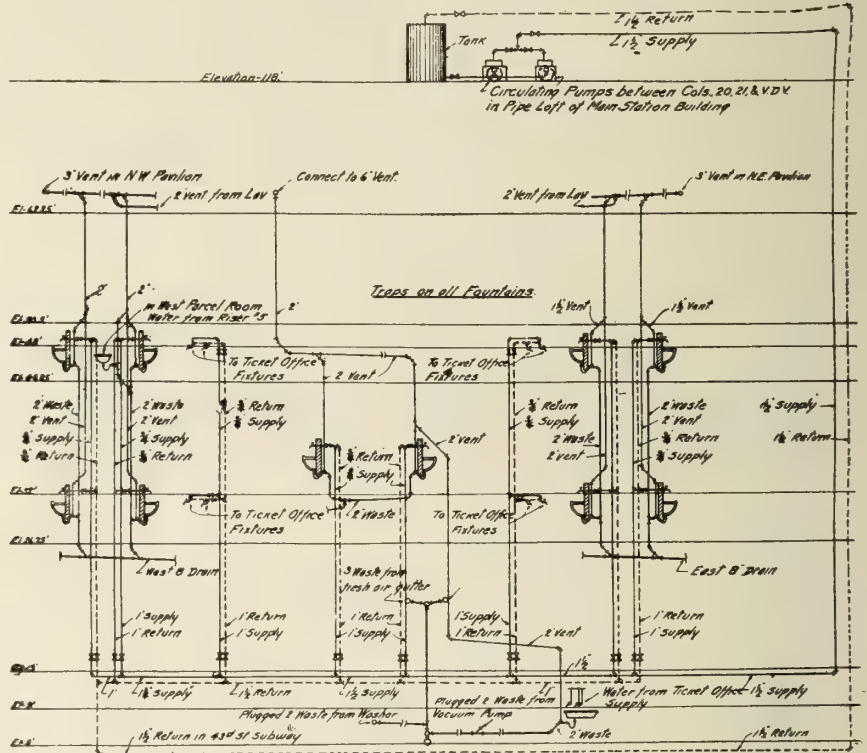
The supply comes through the main 6-in line in 43rd street from three large fire pumps in 50th street service plant. These three pumps have a combined capacity of 3,500 per minute, with a tank storage capacity of approximately 70,000 gallons of water. Each outlet has 100-ft. of hose in two 50-ft. lengths

of the best grade 2½-in. hose, tested to 400 lbs. per sq. in. Each hose has ¾-in nozzle and expanding rings and couplings, and all equal to the standards in use by the Fire Department in New York City. The racks are all strongly bolted to the stand-pipe.

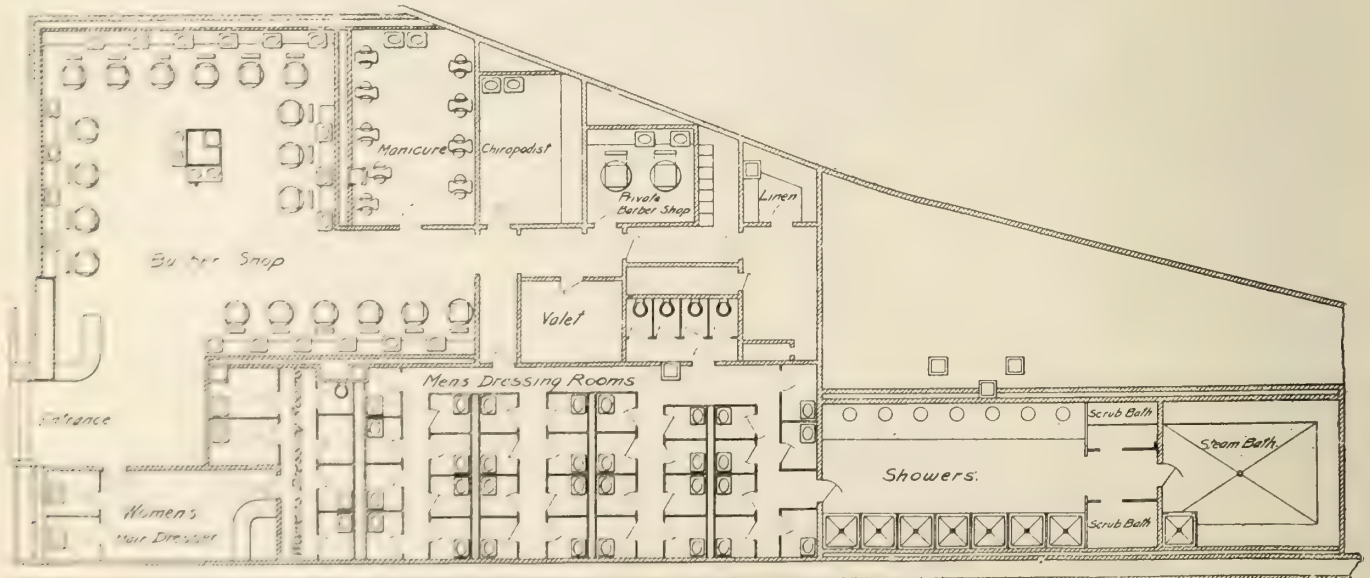
The cooled drinking water system is very fully shown in the drinking water riser diagram. It consists of one (1) motor-driven, 20-ton capacity compression type plant operating on the direct expansion principle. The water receives two filtrations and one ozonation. It is pumped by two motor-

driven centrifugal pumps. All piping has cork covering. This plant supplies both the north and south sections of the station building.

There is installed a high vacuum equipment located in the suburban level loop. The capacity of the system is sufficient to operate simultaneously any 12 standard 12-in. renovators attached to any equal number of outlets in the building. The system is capable of removing in a thorough and efficient manner all dust, particles of dirt, sweepings and the like from carpets, rugs, interior furnishings and furniture of the offices, rooms, cor-



Risers to Drinking Fountains. Details of Piping Arrangements for Waste, Vent and Supply in the New Grand Central Terminal for the New York Central Railroad.



Barber Shops, Dressing Rooms and Shower Arrangement in the New Grand Central Terminal, New York City.

PLUMBER AND STEAMFITTER

ridors, or any other articles or services that are desired to be cleaned.

The air drawing machine is of the horizontal double acting reciprocating type, driven by a direct current electric motor through silent chain drive. The speed does not exceed more than 150 revolutions per minute.

The separators are made of standard steel pipe constructed with all necessary operating, regulating apparatus and cleaning connections.

The air drawn machine, electric driven, has its motor wound for 240 volts direct current.

The piping is all galvanized strictly wrought iron pipe and is installed in such a way as to prevent dust pockets without any sharp, short bends, and all pipe ends are reamed smooth. Brass cleanouts are placed wherever required and all risers are to be carried full size up to the top. All fittings are extra heavy weight of good tough gray cast iron, galvanized and recessed. Long

sweep elbows or bent pipe and 45 Y branches are used on all turns and branches.

The outlets are near the various floors and located in closets, corridors and rooms. The valves are of brass and nickel-plated, easily accessible and sufficient in size and of a design applicable for the work. Couplings, tops, valves and renovators are ground jointed and interchangeable. The outlets in the closets are placed in recessed receptacles and have bronze frame and door properly hinged with a catch.

The following sweeping appliances are furnished: 12 12-in. and 12 8-in. carpet renovators; 12 4-in. hand renovators; 12 8-in. floor brushes; 12 8-in. floor brushes with wirebristles; 12 8-in. wall brushes; 12 4-in. round brushes; 6 9-ft. extension rods in 3-ft sections, and 6 observation glasses.

Each pay toilet has a plate glass mirror, glass shelf, soap dish, towel bar,

two robe hooks, drinking glass and
toilet paper box.

There are approximately 1,400 plumbing fixtures installed in this building.

One of the drawings shows one of the nicest conveniences to be found in any station—a barber shop and dressing room for men and women. This will be particularly useful for commuters who have to go to the theatre or to social functions which require a change of clothes. They can check their suit cases as they arrive in the morning and engage one of these rooms. In the late afternoon or early evening they can come back to the station dress and leave their street clothes in the parcel room. It will then be a simple matter to pick up the luggage on their way home late in the night. This arrangement saves the expense of hiring a hotel room.

Great credit is due to the architects, Messrs. Warren and Wetmore, for the design and completion of this work

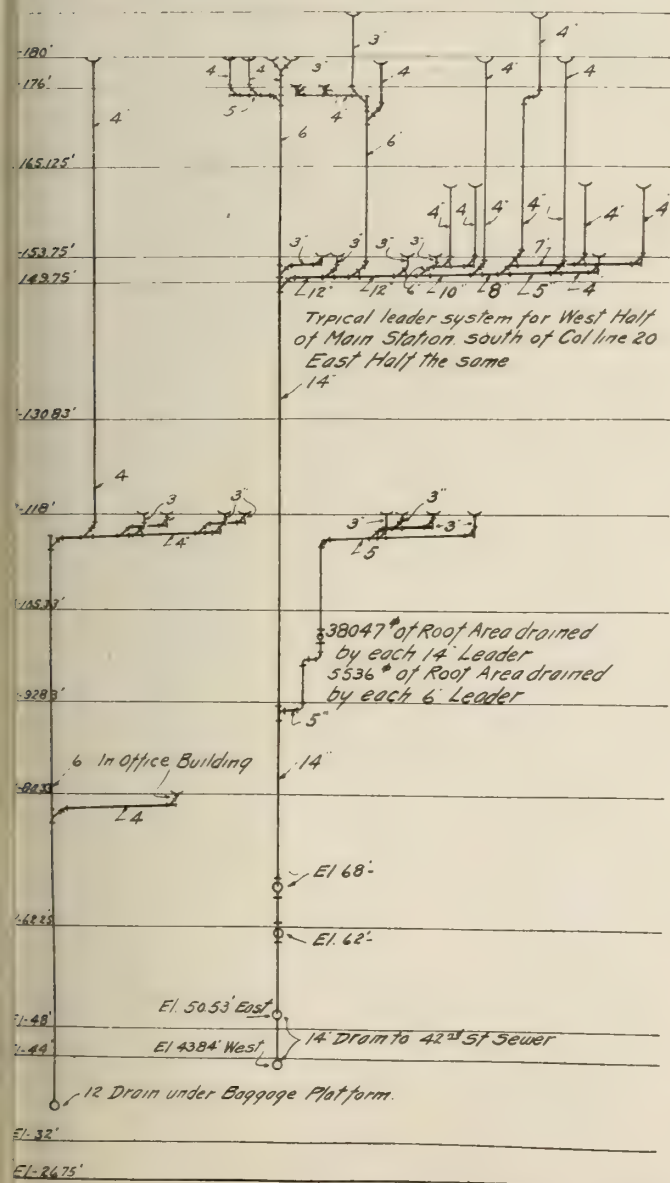


Diagram of the Rain Water Leaders in the New Grand Central Railroad Terminal.

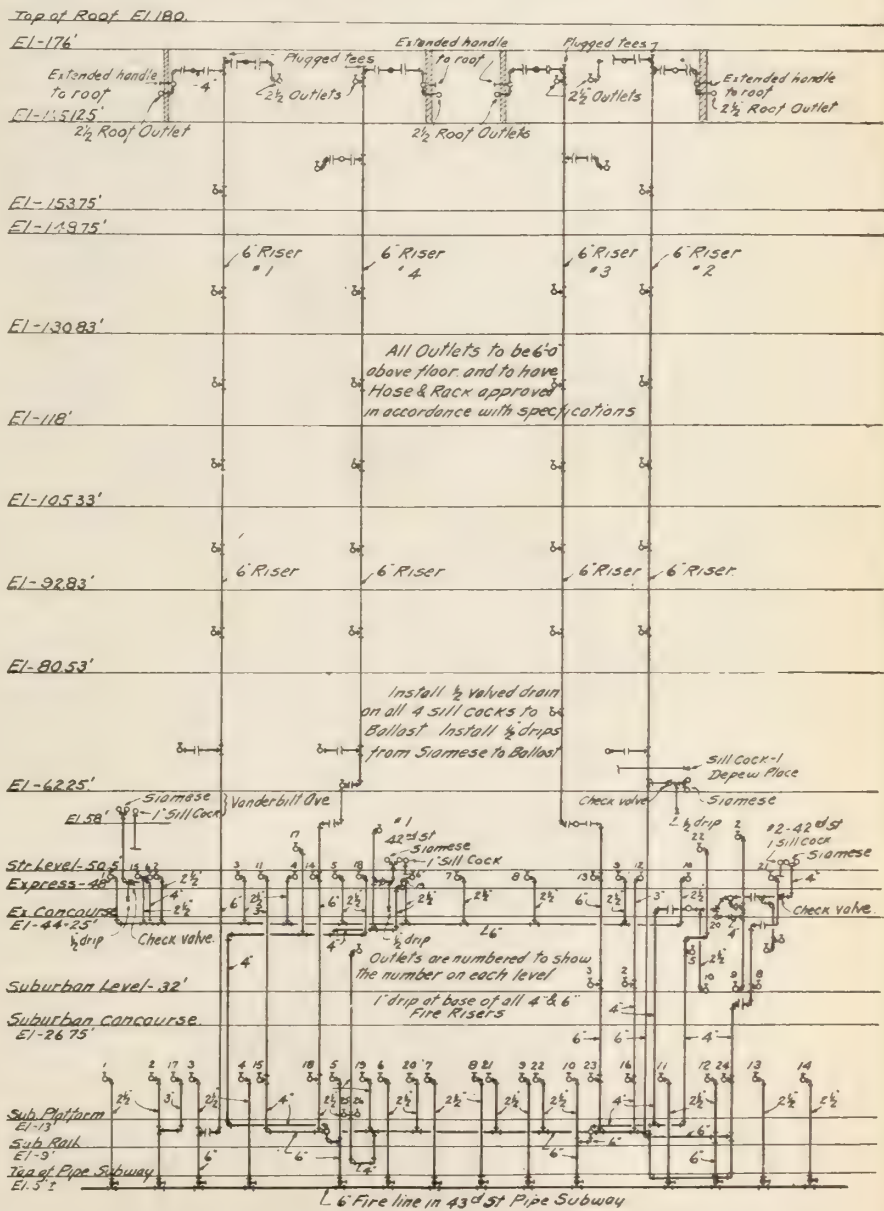


Diagram of Fire Risers, showing Various Connections at different floor levels in the Grand Central Station, New York City.

Complete Course in Sheet Metal Work

By L. W. KOSER

Sometimes iron brackets or lookouts are used, in which case they are driven into or built in the wall.

Wherever the top of the cap comes against the wall it should be turned up 3 or 4 inches and cloak flashed.

On the inclined surface as from 1 to 2 the turned-up edge should be step and cloak flashed, i.e., a piece of metal should be set into the wall, about every second course of brick, and then turned down over the turned-up edge, the finished appearance resembling steps, hence the name, step flashing.

At the bottom of the cap the metal should be flanged and turned against

the wall and let into the mortar line or else folded up in under.

Galvanized or tinned nails should be used and the heads soldered over.

Go over the whole work and point or fill up even with the surface wherever the mortar has been raked out. This is called "pointing."

Also fill up the cracks at the sides where the metal meets the brick walls.

Let us now develop the oblique mitres 1 and 2 and the square end 2 and 3 of Fig. 1.

We will, therefore, draw a section of this top member from 1 to 3 as shown by Fig. 1, prob. 1.

In order to make the problem clearer we have drawn it twice the size shown on the elevation.

From point 1 to 2 Fig. 1, prob. 1 represents the projection from the wall to the front of the cap.

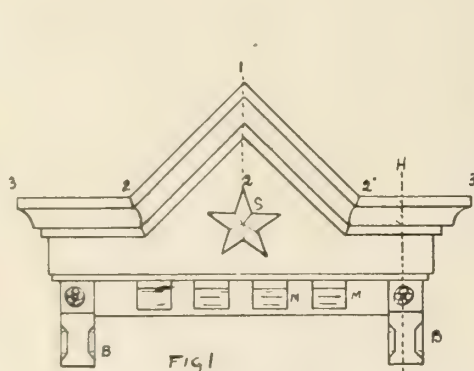
Draw the lines A-B-C representing 1-2-3 of Fig. 1, and at the same angle.

Draw the vertical line J-K representing 1-R of Fig. 1.

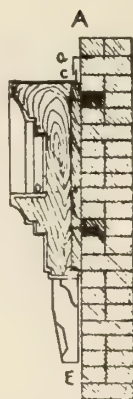
Next draw the profile 2 to 11 at the end C, and draw lines from each number past the point B.

Draw the second profile on the angle. Number each point and project lines each way until stopped on the top by the

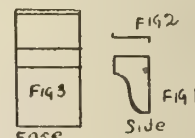
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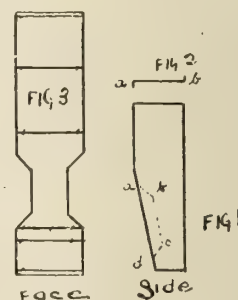
Window or Door Cap.



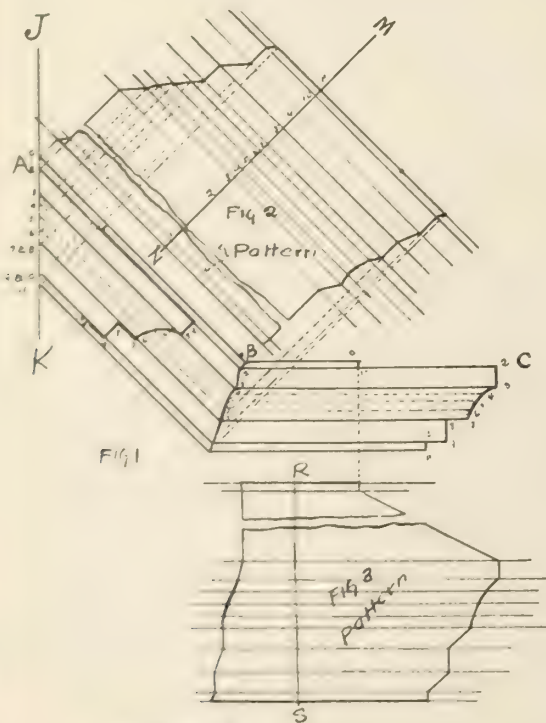
Detail of Reveal



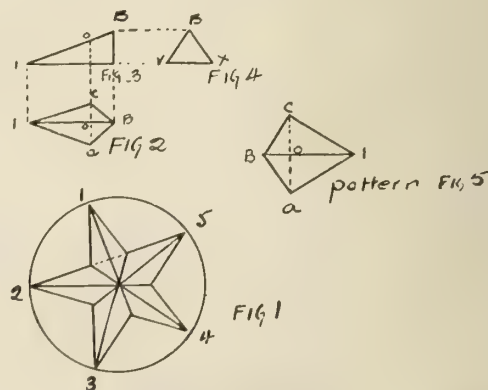
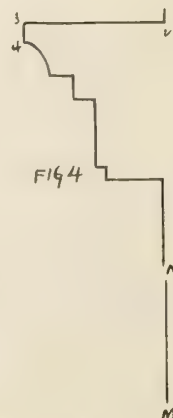
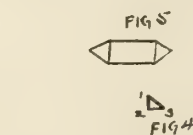
PROBLEM 4



PROBLEM 3



PROBLEM 1



PROBLEM 2

line J-K and on the bottom by intersecting with corresponding lines from the profile at C.

A line traced through these intersections gives the profile at B.

Now lay out the stretchout line N-M at right angles to A-B and transfer to this the different spaces of the profile and draw the usual measurement lines through each number.

Then fix the head of the T sqr. so the blade will run parallel to the line M-N and bring it against each of the numbers on the line J-K and the profile B and carry lines to the stretchout cutting lines having corresponding numbers.

Trace a line through the points of intersection and the pattern is developed for the angle piece A-B, Fig. 1.

Now to get the pattern for the straight piece B to C we draw the vertical stretchout line R-S and lay out on this the same spaces as on the line N-M and draw the usual measurement lines.

Drop lines from the profile B and C cutting the measurement lines having corresponding numbers.

To get the return or end piece draw the profile as per Fig. 4 and develop the same as a square mitre.

To get the star, draw a circle the size of the star wanted, step it off into five equal spaces and draw in the star as shown by Fig. 1, prob 2.

Now take one section or point of the star as 1-A, B, C, and transfer it to one side as Fig. 2.

Now draw Fig. 3 which is a section through 1-B of Fig. 2, B being the high-

est point of the star and 1 being the lowest.

Now draw Fig. 4 which represents a cross section at the point B.

We are now ready to draw the pattern. First draw the line 1-B of Fig. 5 equal to 1-B of Fig. 3.

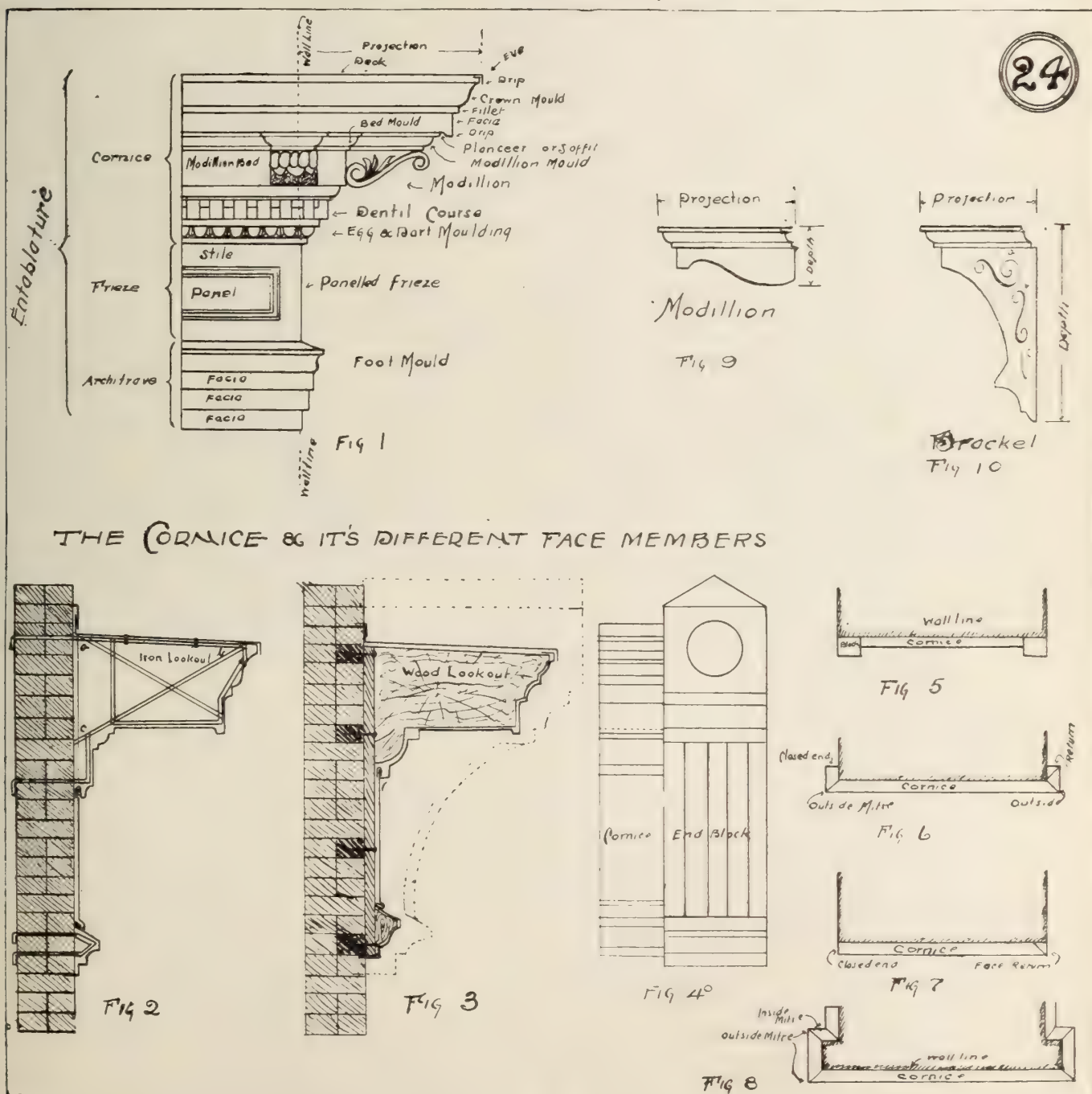
Make 1-0 of Fig. 5 equal to 1-0 of Fig. 3. At the point 0 draw the dotted line at right angles to the line 1-B.

Now lay off the spaces B-V and B-K of Fig. 4 on this dotted line which will give the points C and A.

Connect 1-C and B-A and one point of the star will be complete.

Make four more pieces the same and brake on the line 1-B.

To make the bracket B draw two side pieces as per Fig. 1, prob. 2 cut out on the dotted line for the bevelled edges.



Form the edges of these side pieces as per Fig. 2, the edge at b to go against the wall or surface and the edge at "a" to serve as a flange to fasten the face of the bracket to.

The face shown by Fig. 3 simply follows around the heavy line of the side elevation, each cross line showing where a brake comes.

Fig. 4 is a diagram of the bevel the sides 1-2-3 being the square corner and the line 1 to 3 being the bevel wanted.

Fig. 5 is the pattern for the piece to fit this bevel, the width being taken from the bevel line 1-3 of Fig. 4, and the length on the line 1-B being taken from the side elevation A-b-c-d Fig. 1.

Always solder on the inside where possible, and put piece over the joints, also brace between the sides.

The small bracket M shown by prob. 2 is made the same as the large end bracket with the exception of course that the general shape is different, but the method of fitting and forming is the same.

On plat 24 we illustrate in detail the different parts of a cornice.

Fig. 1 shows a complete "Classic Cornice" or entablature. The term "Entablature," however, is rarely used, the whole being termed a cornice.

A knowledge of the names of the different parts of a cornice is necessary to a sheet metal worker who intends working at architectural work as architect's specifications continually refer to these parts. An architect's specification covering the cornice illustrated by Fig. 1 would read something as follows:—

"The cornice shall be constructed of 26 gauge Queen Head or Apollo Galvanized Iron or equal.

"The deck shall have a fall to the back and provision made to carry the water to the roof.

"The eye of the cornice shall be provided with a drip to keep the water from running down the face of the cornice.

It shall have an O. G. crown mould with fillets top and bottom.

"The facid below this shall be also provided with a drip to keep the water from running back under the planceer and down the rest of the cornice or down the face of the brackets.

"The cornice shall have a planceer or soffit with bed mould at back to receive the mould on top of modillion.

"The modillions shall be modelled to the detail and be spaced 24 inch centres as called for on plan.

"Run Dentil and Egg and Dart cornice as shown and below this run panelled frieze and architrave.

"Cornice to be erected over wrought iron brackets firmly anchored into wall and to be in perfect alignment.

"All joints to be soldered.

"The whole to receive two coats of oil paint and to be sanded to simulate stone."

Of course an architect's specification does not go into all this detail. As a usual thing he expected you to get this information from the plans. The best architects, however, are usually the ones most particular about small detail and we give you this extract to familiarize you with the different parts.

Fig. 2 shows the method of constructing a wrought iron bracket and fastening cornice on same.

In forming iron brackets bear this point in mind, viz., that all light construction depends on the triangle of strength, consequently, the main feature of your iron bracket should be a triangle such as a, b, c, to carry the projection.

The outside line of the bracket should follow the profile of the cornice in a general way so as to touch same. Wherever using a bolt, run small brackets to assist in sustaining the weight.

Brackets should always be considerably stronger than is necessary to carry the weight of the cornice above as snow and wind pressure add considerably to this weight.

Cornice is fastened to iron brackets by means of a flat headed bolt the nut being on the inside. Solder a small piece of galvanized iron on back of cornice as reinforcement wherever a bolt is used. Where cornice abuts a fire wall the dock of the cornice can either fall to the front or to the back. It is advisable, however, to have the fall to the back. A trough can be provided to carry the water to the ends of the building and then down or the water can be carried through the fire wall by taking out a brick and lining the opening with galvanized iron.

The back edge should be turned up against the wall not less than 6 or 8 inches, and a counter flashing let into the bricks and turned down over same.

Fig. 3 shows the method of making a wood bracket and fastening cornice to same.

The wood bracket can be either fastened to the wall by means of wood bricks or 2 x 4 scantling laid in wall or better still the wood bracket or lookout can extend back through wall and be bricked in. This latter course is only possible on new buildings as it has to be done when wall is being built.

Iron brackets are preferable to wooden ones as they are entirely fire proof and do not warp or twist the cornice.

The dotted line shown on Fig. 3 represents the side of the end block, face of which is shown on Fig. 4 as is also a section of the cornice.

The dotted line on cornice Fig. 4 represents members hidden from view when looking straight at the cornice.

Fig. 5 is a plan of the front of the building showing the way end blocks are used.

Fig. 6 shows the cornice returning around the sides of the building one end being closed and the other "return."

A closed end means simply that the cornice stops short or is cut off straight and the end closed by soldering on a piece of metal cut to the profile of the cornice.

A return means that all of the members return or go back against the wall and stop.

Fig. 7 shows a closed end and a face return which means that the top of the cornice is kept flush with the side of the building and the other members come up to the mitre line and return back to the wall.

Fig. 8 shows a plan having inside and outside mitres.

Fig. 9 shows a modillion which represents the projecting end of a timber and gives a supporting effect.

A modillion is distinguished from a bracket by having more projection than depth.

Fig. 10 shows a bracket which is another name for brace and in stone cornice it is used to carry enormous weight while in metal cornices it is used to give the same effect where large cornices are used.

A bracket always has more depth than projection.

The sides of a bracket usually have some scroll or ornamental work to break the monotony.

This is usually incised work, i.e., the metal is incised or cut in the form of a scroll and a narrow strip soldered or strip edged to the sides to form a projection.



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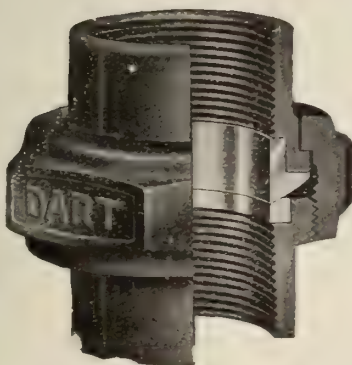
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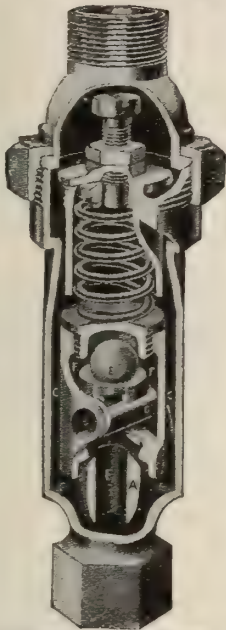
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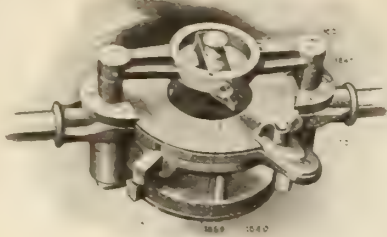
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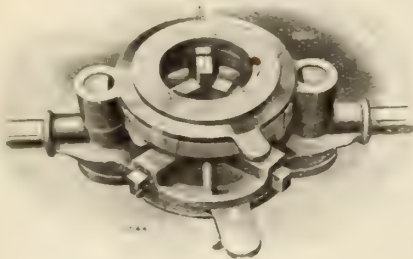
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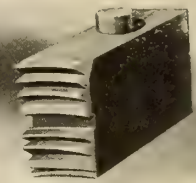
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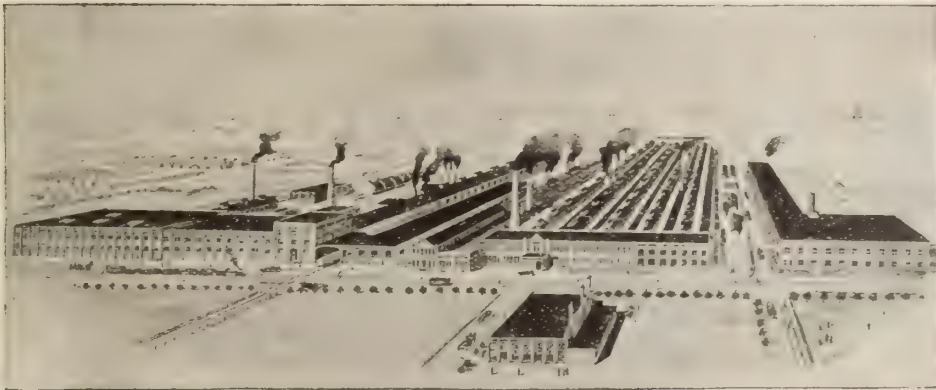
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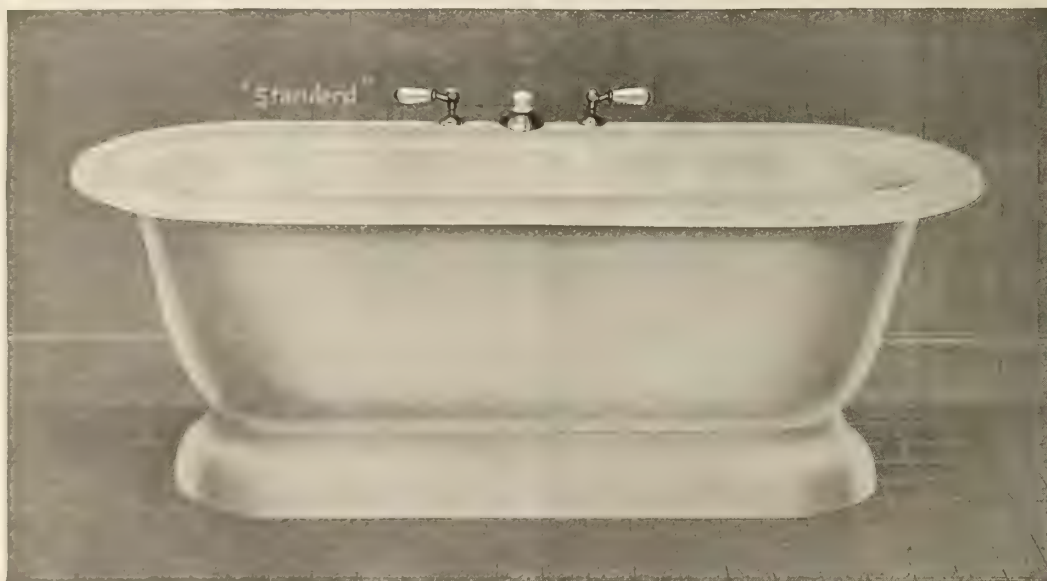
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The Daisy Firepot is made of such depth that all the gases are consumed in the combustion chamber, resulting in a high temperature of the water on a minimum consumption of fuel. On the inside of the firepot are vertical ribs, of sufficient size to allow the air to rise freely through the coal at the outside edges of the fire, keeping it burning evenly and preventing the accumulation of ashes near the water in the fire-pot section.

The Daisy is a guarantee of efficiency and durability.

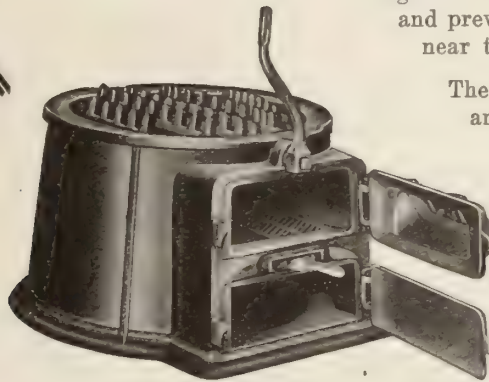
**Keep a
Sample of
this Business
Builder in Stock**

The advantages of this boiler are certain to cause your customers to give it the preference—you reap a good, clean, satisfactory, profit and will be selling a boiler that will be an advertisement to your business.

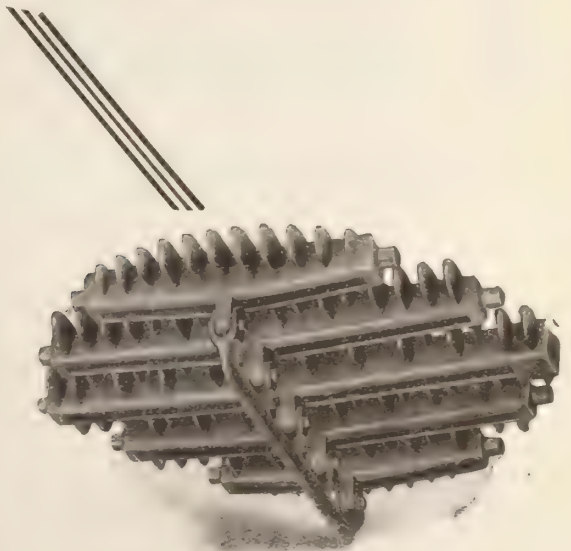
The "Daisy" is the result of over 50 years' careful study of the hot water system of heating. Many exhaustive tests were made before the perfected boiler was placed on the market.

Our reputation and guarantee stand back of every "Daisy" Boiler which we sell.

It is easy to make "Daisy" sales.



**DEEP BASE OF DAISY HOT WATER BOILER,
SHOWING ASH SIFTER AND GRATE**

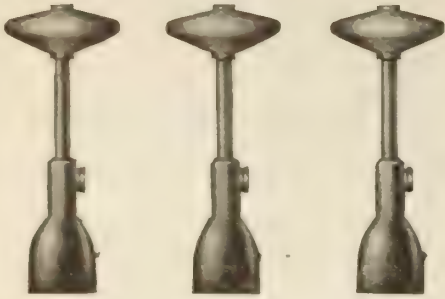


THE GRATE

Warden King, Limited
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AGENTS The Crane & Ordway Co., Winnipeg, Man.
IN The Mechanics' Supply Co., Quebec, Que.
CANADA: The James Robertson Co., Ltd, St. John, N.B.
The Wm. Stairs, Sons & Morrow, Ltd., Halifax, N.S.



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It is one thing to theorize, another to practice. A theory successfully demonstrated is a proof of its accuracy—an assurance of truly scientific conception.

The universal success, the never-disappointing operation of the Honeywell hot-water system has proven conclusively that the theory upon which it is based is correct even to the utmost detail.

An increased and positive circulation; an instantaneous heat under perfect control; quickly increased or checked; the use of smaller valves and piping; the sending of even heat into radiators at extreme distance from boiler; the one-end radiator tap, the saving of floors from "butchery": beams from weakening and ceilings from leak stains; minimum amount of piping an easy layout for the fitter, enabling expeditious placing of radiators, and the minimum cost of installation and operation.

All these points have been realized and proven by years of trial and thousands of plants in use in all countries.

Each feature combines to make the Honeywell the favorite method with house owners and the one generously and generally specified by far-seeing architects and heating contractors.

We would be pleased to furnish you with full information and engineering data.

Honeywell Heating Specialty Company

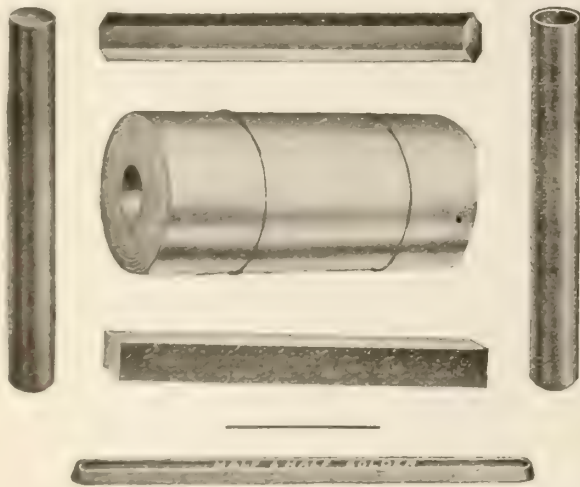
Wabash, Indiana

Frank T. Rawley,
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Phone Main 4615



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HOT WATER RADIATOR VALVE



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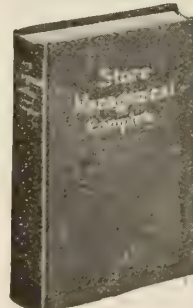
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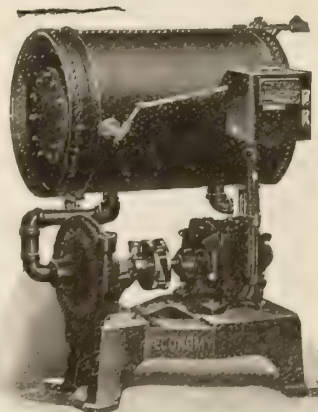
CHAPTER V.—**The Store Policy**—What it should be to hold trade. The money-back plan. Taking back goods. Meeting cut rates. Selling remnants. Delivering goods. Substitution. Handling telephone calls. Rebating railroad fare. Courtesy to customers.

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Economy Automatic Condensation Pump and Receiver

An expansion tank, an automatic switch and a centrifugal pump automatically operated by an electric motor.

Stimulates circulation by drawing condensation through system, venting the air and returning the water to the boiler at high temperature.

Eliminates snapping and cracking in the radiators and pipes.

A stimulant and governor to the entire system.

A great saver of fuel.

Requires no attention other than an occasional oiling.

Operates equally well on high or low pressure systems.

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who spend twice as much strength and work twice as hard as you need to, are simply out of pocket, because you spend two days' strength for one day's pay. You eat up your very stock-in-trade twice as fast as is necessary.

Since you can get a die that cuts pipe-threading in half, don't you think you are hurting yourself most by not **trying** the Nye Die? All the more so when I offer you a 10-day free trial of it at my own expense. No man ever bought the Nye Die until he found out by **actual test** what a really wonderful die it is—how it cuts all pipe-threading labor in half. Over 15,000 Nye Die users, not **now** and **then** but **all the time**.

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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
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Ask your jobber for

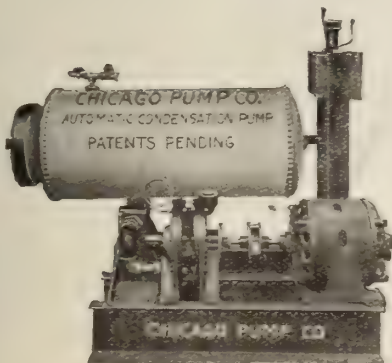


Brand

CANADIAN TUBE & IRON CO., LIMITED

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Works: Lachine Canal



To Messrs. Plumber, Steamfitter and Company

Gentlemen,—Good circulation in a STEAM HEATING SYSTEM is just as important as good circulation in the human body. When the circulation is bad, tenants get COLD FEET, which is always a bad omen. Chicago Pump Company's Automatic Electric Condensation Pump is the HEART OF THE SYSTEM. It is essential to perfect heating! Perfect heating is essential to paying property!

Never let a man tell you he cannot afford to install our Condensation Pump: the fact is, he cannot afford to be without it. It is far cheaper to pump Condensation water and air out of the system by electricity than it is to carry high steam pressure to force it through the Radiators and return lines. Steam is expensive! Coal and firing—labour are large items!

Our Pump eliminates water hammering in radiators and saves its own cost in one season: if it doesn't we want to know it.

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CHICAGO PUMP CO., Chicago, Ill.

Agents wanted. Write for particulars.

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TWO CENTS PER WORD

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"KING" Round Water Boiler.

(Sizes 1 to 8½)

"ROYAL" Round Steam Boilers.

"ROYAL" Square Steam and Water Boilers

(19" to 48")

"KING" Radiators, Water and Steam.

We have a great deal of pleasure in announcing to our friends in the Trade that **our complete line** of Boilers and Radiators for Steam or Water are now ready for delivery.

We have all sizes, from the smallest to the largest, in stock for immediate delivery.

Prompt Shipment Guaranteed

SEE Sectional View of 36"
"ROYAL" Steam Boiler.

Heating Surfaces

NOTE the **Arched Fire Chamber** and greater **over hanging** heating surfaces, than any other cast iron boiler on the market.

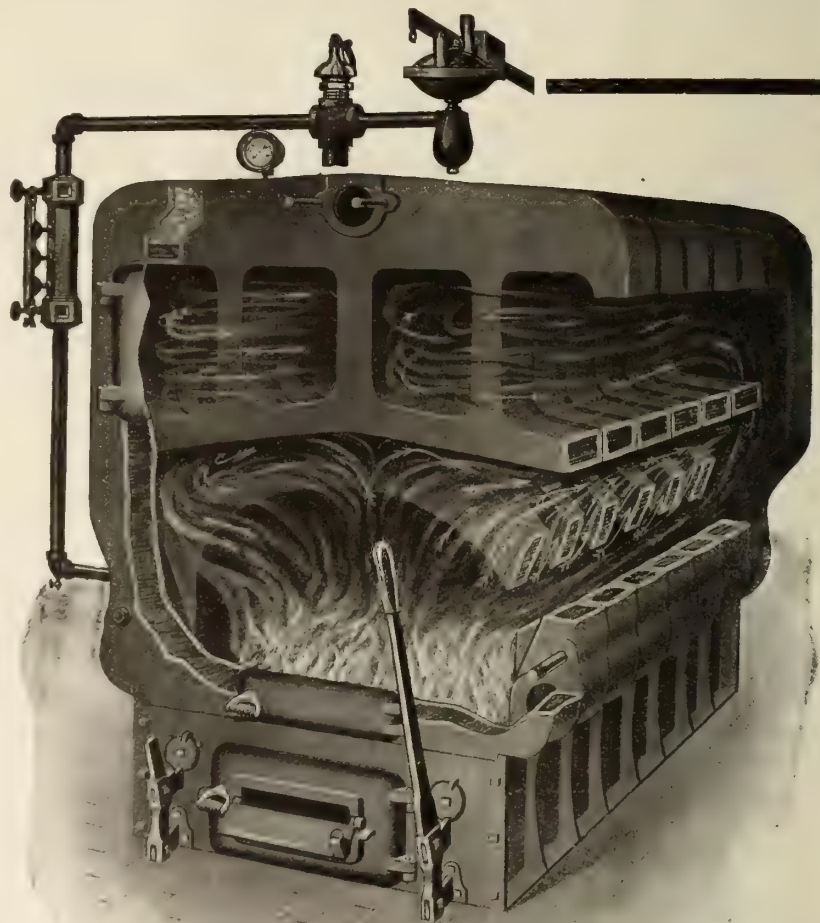
Fire Travel

OBSERVE the **Triple Fire Travel** on **both sides** of boiler, also the **cross fire channels** between each section.

Satisfy your customers. **"ROYAL"** Boilers will satisfy the **most** exacting. **Try one.**

The **"ROYAL"** Boiler carries with it the same unqualified guarantee as the **"King"** Water Boiler.

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Heating and Ventilating in Toronto Schools

Description of Heating, Ventilating and Vacuum Cleaning Systems in Duke of Connaught School, Toronto, at Present Under Construction—Automatic Control a Strong Feature.

The Duke of Connaught School on Morley Avenue, Toronto, Ont., now under construction has every indication of being one of the most up-to-date buildings of its kind in Canada in every respect. The structure is being erected by the Board of Education, Toronto, and should make interesting reading for all connected with the plumbing fraternity. Designing and supervising engineers are Canadian Domestic Engineering Co., Ltd., of Montreal, and Toronto. Heating and ventilation systems electric wiring and vacuum cleaning system are being installed by Keith's, Limited, of Toronto, while Purdy, Mansell, Ltd., also of Toronto have the contract for the plumbing installation.

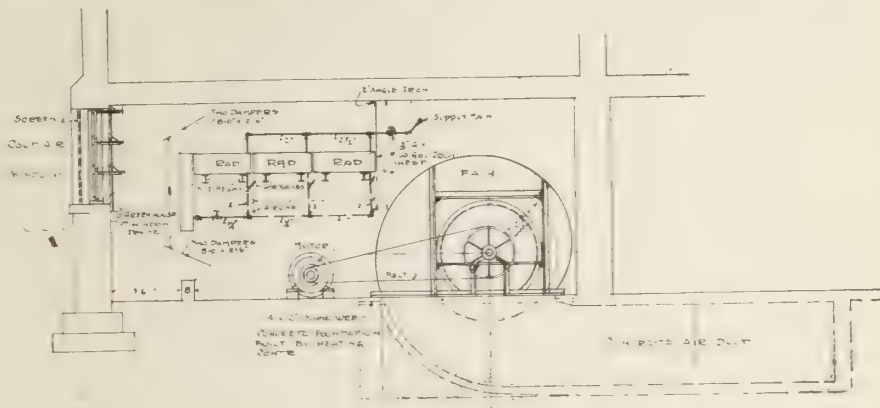
The heating and ventilation consists of a combined system of direct radiation and forced ventilation. The direct heating system is a two-pipe steam job. An evenness of temperature is maintained throughout the building by automatic temperature control. This consists of an automatic valve on each radiator connected with a thermostat and thermometer in the room. In connection with the job is an air line running

ing a certain vacuum keeps up circulation at such times as it is inclined to lag.

Perfect ventilation is accomplished through two separate fans in the base-

the Duke of Connaught school are of such interest that description in detail is given in part as follows:

Two horizontal return tubular boilers are set complete in brickwork. The



Section through Fan Room, Duke of Connaught School, Toronto, Ont.

ment supplying fresh air through a system of ducts to each and every room.

Plans of the building are all arranged so as to provide for an extension at some future date, and both plumbing and heating is being laid out in such a way

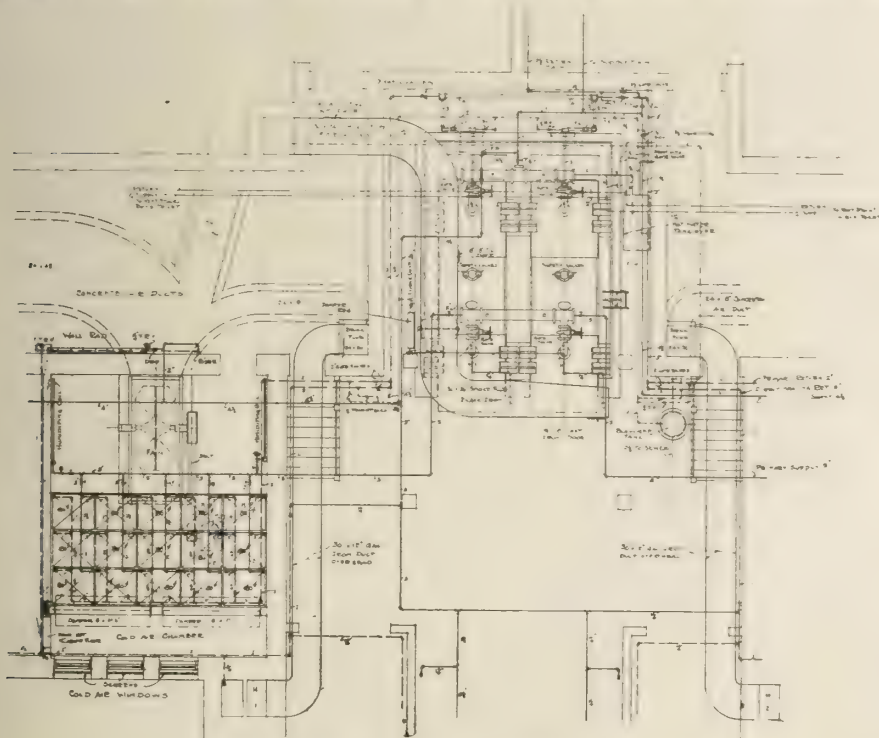
boilers must be of the following dimensions: Diameter, 66 inches; length 19 feet 4 inches; 74-31/2 inch tubes, 18 feet long, made of charcoal iron, shell 7-16 inch thick, head 1/2-inch thick.

The shells are 19 feet 4 inches long and 66 inches in diameter, measured on the smallest course, and made in three courses, each course to consist of one plate. The longitudinal seams are in the upper half of the shell, well above the fire lines, and courses are broken in the usual manner. The shell plates are 7-16 inches thick of homogeneous open hearth fire box steel, having a tensile strength of not less than 55,000 pounds, nor more than 65,000 pounds per square inch of section, with not less than 56 per cent. of ductility, as indicated by contraction of area at point of fracture under test, and by an elongation of 25 per cent. in a length of 8 inches. The chemical test must show not over .04 phosphorous and .04 sulphur. Each plate must also stand bending double when cold, when red hot, and after being heated red hot and quenched in cold water, without signs of fracture.

Each head is 1/2 inch thick, of best open hearth steel, same quality of metal as shell plates.

The boilers are to be tested in the presence of the Engineers, or their authorized representative, to 150 pounds hydraulic pressure per square inch. The boilers must be tight under this pressure before leaving shop.

After the boilers have been set, the manhole and handhole plates are to be



Plan of Boiler and Fan Room.

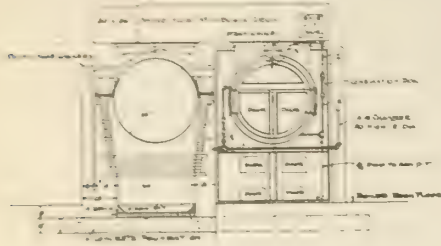
from air vents on radiators to a small automatic hydraulic vacuum pump. This pump assists in the circulation in starting up the system and also by maintain-

that at time of future extension connections with present system may readily be made.

Heating and ventilating systems, in

PLUMBER AND STEAMFITTER

removed and an internal inspection is to be made in the presence of the Engineers or their inspector. Afterwards remove all dirt, brick, etc., and leave boilers perfectly clean.



Cross section and front elevation of boilers, Duke of Connaught School, Toronto, Ont.

Each separate radiator throughout the building has valves as shown. All radiator valves in finished rooms are automatic, nickel plated, rough bodied valves, either angle or off-set pattern, no globe valves are used.

Gate valves are placed in the basement on all risers and returns. Valves not larger than 2 inches are brass, and 2½ inches larger are iron bodied. All valves around boilers are outside screw and yoke.

Furnish for each radiator or coil a ¼-inch x ⅜-inch Monash No. 3 Telwen N. P. air valve, and for each stack of Indirect Radiators a No. 13 Monash New Pattern or "other approved," placed as shown on detail. All Radiator valves are connected with the air line system.

Vacuum Cleaning System

The vacuum cleaning system is of

All joints are carefully made and the ends of the piping where they enter the fittings are carefully reamed so that no burrs or ragged edges are left to catch lint or dirt.

Fans, Motors and Heaters.

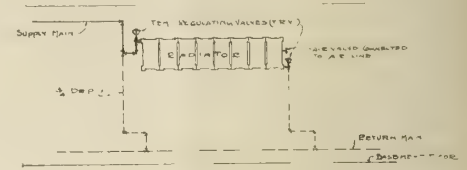
There are two fans described as follows:

The fan wheel is 7 ft. in diameter and is of a double inlet cone pattern, bottom horizontal discharge, with twelve blades, 32 inches wide at the tips; diameter of the inlet 56 inches; depth of the blade at inlet ring 46 inches, and cones are of cast iron and are attached base to base securely bolted and between have a disc of No. 10 steel the same diameter of the wheel, for the purpose of carrying the blades; edges of the blades opposite the disc are attached rigidly to conical annular plate in such manner that the cones, disc, blades and annular plates make a rigid, symmetrical, well-balanced wheel which runs true and without vibration in its shaft.

The blades are made of sheet steel No. 12 gauge, and the annular plates of No. 14 gauge. The wheel was delivered in knocked down form and assembled on

not less than 3¾ inches in diameter and the cast iron cones are securely keyed to the shaft, all bearings being anti-friction ball bearing. Each is furnished with ½ pint oil cup.

The inlets of the fan housing are stiffened with angle rings 2 x 2 inches x

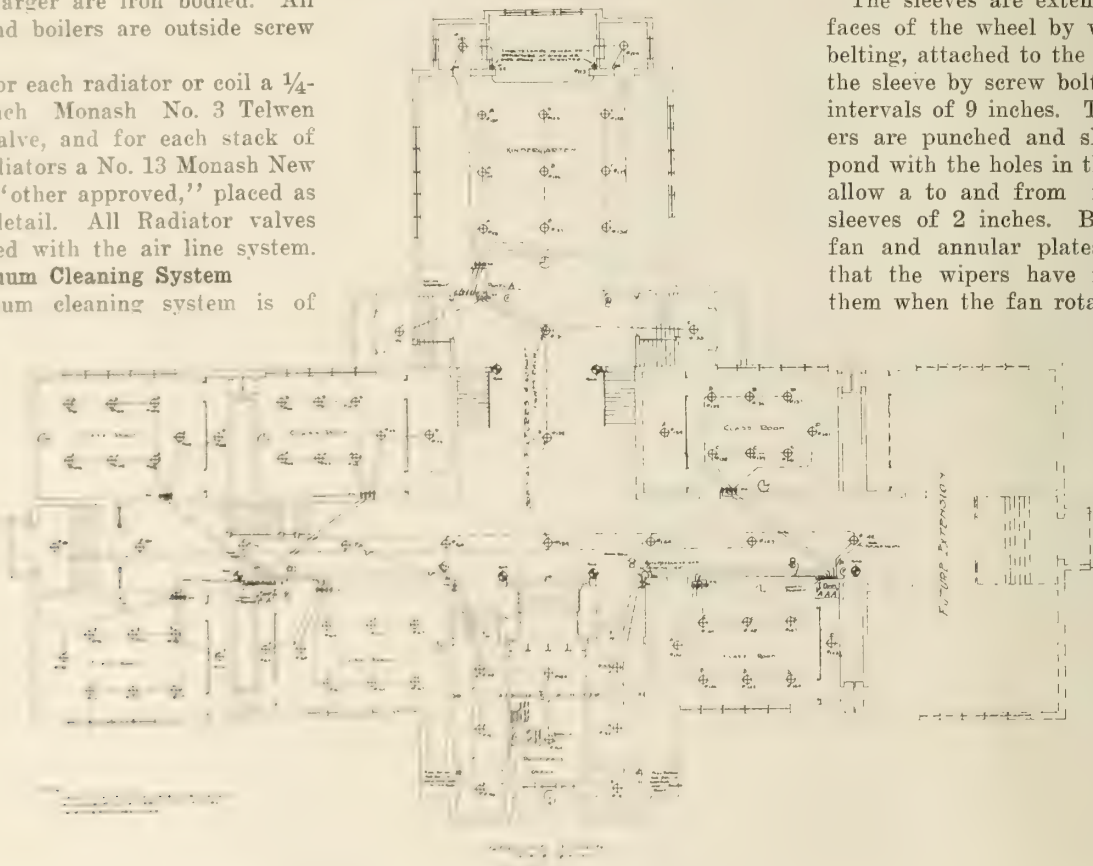


Typical elevation of radiators in basement, showing connections. Duke of Connaught School, Toronto, Ont.

3-16-inch; attached to these rings by screwed bolts are sleeves of No. 14 iron extended from the inside of the fan housing to within 1 inch of the outer surface of the annular plates of the fan.

The diameter of the intakes through the fan housing is 2 inches larger than the diameter of the intakes of the fan wheel.

The sleeves are extended towards the faces of the wheel by wipers of 4 inch belting, attached to the outer surface of the sleeve by screw bolts and wipers at intervals of 9 inches. The belts or wipers are punched and slotted to correspond with the holes in the sleeves and to allow a to and from motion on the sleeves of 2 inches. Bolt holes in the fan and annular plates are so placed that the wipers have no contact with them when the fan rotates.



Electric Wiring Plans for Duke of Connaught School, Toronto.

sufficient capacity to maintain five inches of vacuum on a 2-man sweeper plant on the extreme ends of the lines, with automatic operation. All necessary equipment shown on plan, is advanced one full length on each side.

the premises; all parts being secured in position by the use of slotted head screw bolts and only the round heads exposed on the inside or air way surfaces of the fan.

The fan wheel is mounted on a shaft

Automatic Control.

Automatic Control is installed in all basement rooms, class rooms, teachers' rooms, reception rooms, and corridors. The class rooms, teachers' rooms and reception rooms are controlled by one

PLUMBER AND STEAMFITTER

thermostat and one pair of automatic valves. Corridors have two thermostats. The primary heater is controlled by graduated action dampers and one thermostat and one hot air duct thermometer for each side, controlling the temperature of the air to the fan.

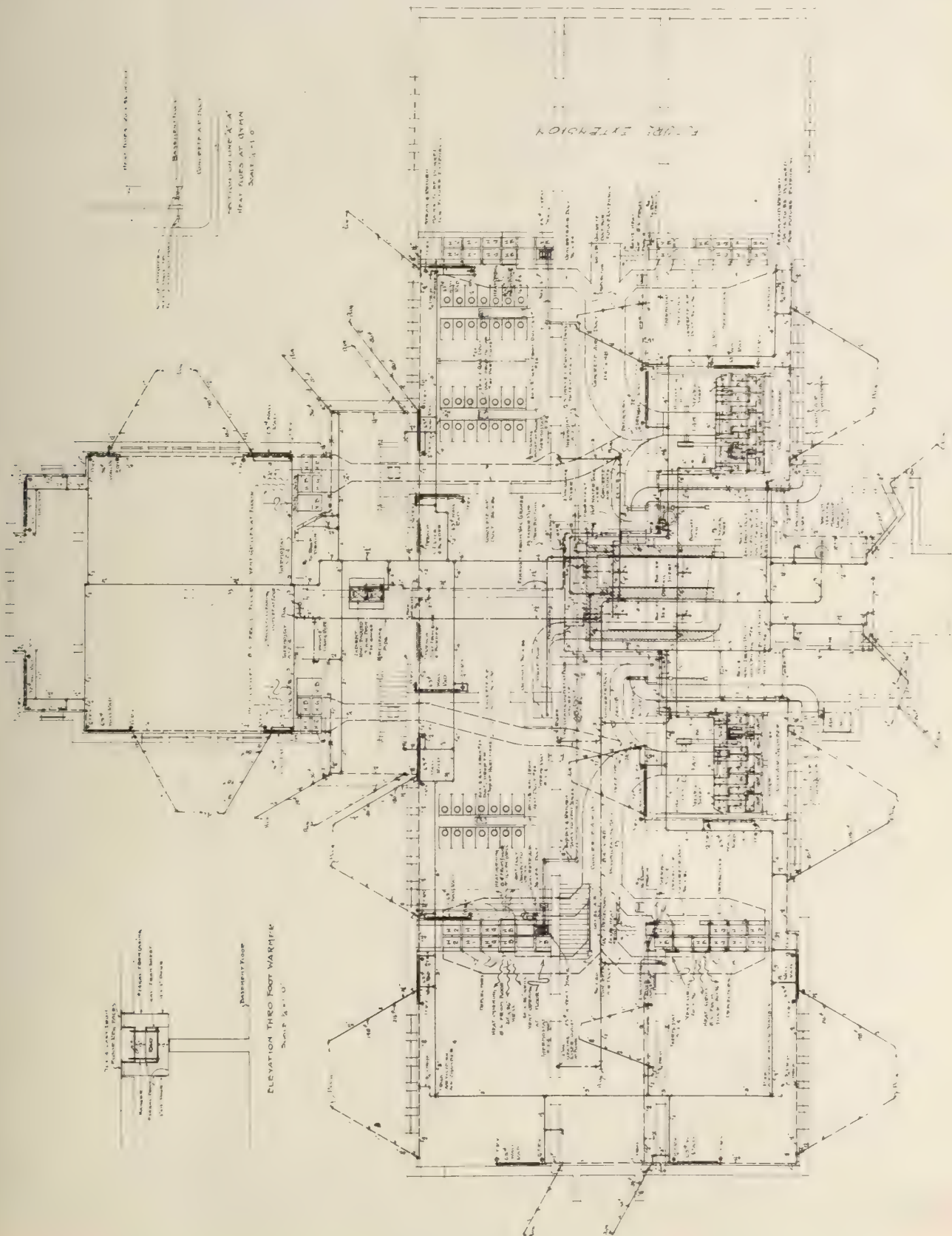
A damper made on angle Iron frames

is set in each vent flue throughout the building. These dampers are set on an angle of 15 degrees, and measure approximately 20 inches wide by 26 inches long. These dampers are automatically controlled from the janitor's room by graduated action switches. Each series of flues is brought back separately to

this point where the switches are placed on a marble or slate board and each designated.

Air Line Piping.

A system of air line piping is run and each air valve on all radiators is connected to this system, carrying a main line back to the point designated and



Plan of heating and ventilating system for Duke of Connaught School, Toronto, Ont.

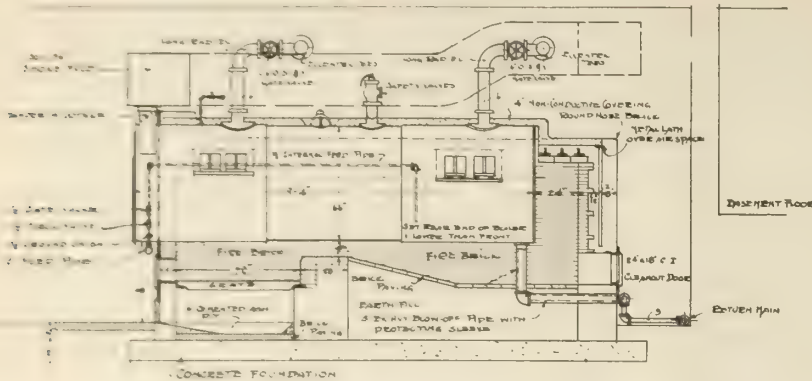
connected there with a galvanized iron tank 18 inches in diameter and 30 inches long. An automatic hydraulic vacuum pump and condenser are mounted on

the year was turned down by the strikers who are asking 40 cents now and 45 cents in August. At present, matters are pretty much at a standstill.

claimed for the "Presto" that its economy is due to the fact that every particle of heat is utilized, and in buildings where it has been installed, a saving of from 25 per cent. to 50 per cent. in fuel consumption has been effected.

The amount of heating surface in the "Presto" is exceptionally large. There are 8,000 square inches of heating surface, while the amount of water covering this, is only fifteen gallons.

The Presto Heater Company own the Canadian Patents and have made arrangements with The Harris Construction Company, of Montreal, for the manufacturing and selling of this heater throughout Canada.



Longitudinal section through Boiler Setting, Duke of Connaught School, Toronto, Ont.

slate tablet 7/8-inch thick, full length of pump which is securely fastened to the wall by expansion bolts with finished rosette nuts.

TEST AND ADJUSTMENT.

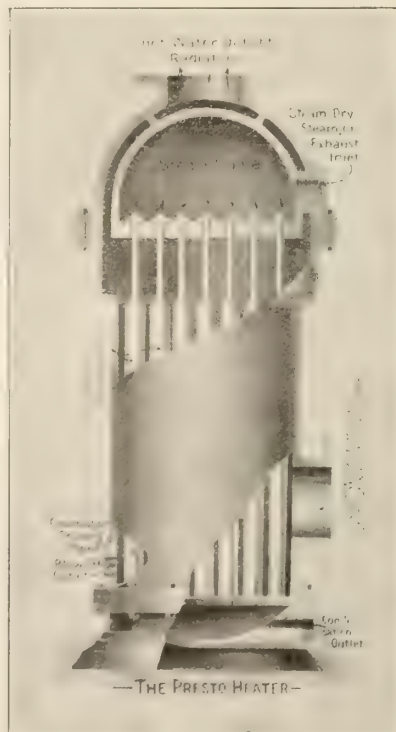
After the boiler is set and mains run and connected to the system in the building, the contractor is to start slow fires under the boilers, and first dry out the setting, after which the pressure is to be run up to fifteen pounds, keeping all return valves wide open to the sewer for two days or until the system has been thoroughly cleaned out.

After the work herein described has been completed, the contractor will put the entire system in working order, adjust the dampers in the flues to various rooms, with the anemometer and regulate the flow of air as instructed by engineers for each room, make any other adjustments found necessary, and is to further assist the engineers for three days to regulate the system.

A NEW HEATER.

The Presto Heater Company, of Montreal, Que., have recently placed upon the market a new heater known as the "Presto." This heater can be used with steam, exhaust, or otherwise, but for small buildings, gas or oil is the method of heating employed.

The illustration, herewith, gives a sectional view of the "Presto Heater"



—THE PRESTO HEATER—

when steam is the method of heating employed. The other styles are practically the same, only that where gas, or oil, takes the place of steam, burners are placed at the base.

Simplicity of construction and economy in fuel are the two most important characteristics of the new heater. It is

SETTLING THE CONTRACT.

Editor, Plumber and Steamfitter,—Some of the people we have to deal with seem to think that they should be allowed to "hold back" a certain part of the amount paid for the plumbing or heating job until they "see just how it works." Can you tell me if this is customary, and if not, how I can get around it?
A. McAnnall.

We believe that the custom of paying in sections is followed on some forms of government and public works. There is a time limit set, however, as to when the payments shall be made, and also the percentage paid. Upon final test the job is settled for full. This is very different from the state which you describe, for we have known of cases where the owner has avoided payment of the final amount for many months. If the customer desires to withhold some of the money, set a limit on the amount, and also have a definite time when the last payment shall be made. Do not leave it to the fancy of the owner. If the job (heating) is completed, say, the last of October, sixty days, or January 1st, should be plenty time enough to allow the customer to try out the plant. If one has acquired a good name in the heating line, a fair talk with the customer will, many times, show him just how ridiculous his position is, and he will be glad to settle in full just as soon as the job is fired up and tested out. A responsible heating contractor who does first-class work and fulfils his contract has a right to expect prompt settlement in full from the customer.
D. C. H.

PROGRESS IN ST. CATHARINES.

The St. Catharines plumbing fraternity, H. A. Bald and Chas. Hoepel were in Toronto on business a week ago. Speaking of conditions in St. Catharines, Mr. Bald stated that as yet the society was weak and lacked thorough organization, but he was glad to report rapid progress since time of starting. Steps are now being taken to unite with the Ontario body and it is hoped that the next year will see the St. Catharines Society a branch of the Ontario Society.

Considerable trouble has been experienced during the past few weeks on account of the journeymen's and helpers' strike. An offer of 40 cents straight for

Other Sanitary and Heating Engineers in Toronto recently are: E. S. Coppins, of Woodstock, Ont.; Walter Martin, of Gananoque, Ont.; Ben Noble, of Noble & Rich, London, Ont.

Tips for Helpers---By "Phoenix"

CANNING INFORMATION.

There is no reason why valuable information of a practical nature should not be canned in a place where one may easily lay hold of the pointers when desired. Almost everybody remembers of having read of a certain fact, instance, problem or circumstance that they have thought to remember against time of need and then when the exact occasion arose and they had a war chase

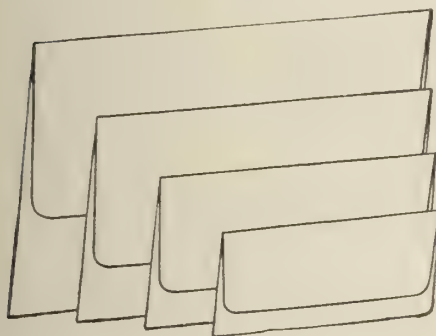


Fig. 1.

for the clipping it turned up missing.

We have all seen the time when some little clipping of such a nature would have saved considerable time and worry. The business man of to-day who is running any kind of a business finds that he must have some sort of a filing system. Years ago it was not so necessary, but the times have changed. Now any master, journeyman or helper in the plumbing and heating business who takes and reads any of the trade papers has not the time to file away those papers for future use. The papers are generally glanced over and then thrown away; or perhaps an item or two clipped and laid aside for use. Then the item disappears mysteriously.

Some place for keeping such information is of the greatest value as many have found who have tried it out. A drawer for the purpose is better than no place at all, but when one gets two or three hundred of such clippings in one drawer he begins to realize that "order is Heaven's first law."

Therefore in addition to having a place to store these clippings and information, said place must be arranged with some kind of system or the advantages will be greatly lessened to the user. There is no reason under the sun why a journeyman or helper should not have

some such plant of information if he so desires.

Book information is all right enough, but even at that the way that the indexes of some books are arranged forbid a ready reference and one has to spend some time in finding just the item sought. Again, one will remember just where any certain item is if one arranges a system for himself.

One of the most simple means of filing away the clippings is by means of a series of envelopes somewhat similar to those shown in Figure 1. These envelopes can be of different sizes and colors also if a strict classification is desired.

With anywhere from ten to fifty of such envelopes filed according to numbers or subjects just one drawer any old place becomes a most valuable asset in time of need. One can hardly realize the number of valuable clippings that will accumulate once the party gets started until it is tried out.

Clipping from the questions and answers of any trade paper in our line will give the interested one somewhere from 200 to 300 items per year. This pans out so upon the experience of those who have tried it and there are more in the ranks of the journeymen than any one supposes now doing it.

In course of time the accumulated information will most likely become too great for one drawer and some form of a cabinet similar to those shown in Figures 2 and 3 may be desirable. The



Fig. 2.

writer does not favor the idea of small envelopes and pigeon holes as items so filed are not easily got at and besides it takes too much time to place them away.

The wide variety of general and specific information that is published in the trade papers is worthy of being kept for future use. Not every person desires to keep the same information and hence this filing idea.

Again the information thus filed is right up to date and comes from all parts of the trade. It also consists of various problems and solutions that never find their way into any of the

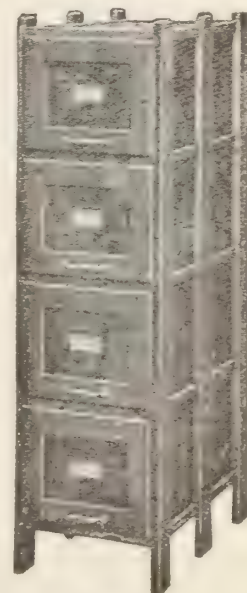


Fig. 3.

books on the subject and, many times, you will hit just the very cure for the case you are up against.

A good scrap cabinet that has been carefully filed and where the clippings have been selected with some care is worth fully as much, if not more, than the sum total of all of the books published on the same subjects. I am not "knocking" the books any for they are all right in their place. But there is a place, also, for the information that can be obtained by using the scissors from week to week.

Try this idea out for one year and the writer is sure that you then would not be without a convenience of this kind for many times the slight cost and trouble that it brings.



OPENING UP NEW BUSINESS.

R. J. McCauley, director and manager of the W. J. McGuire and Co., Limited, plumbers and steamfitters, 332 Craig St. West, Montreal, is retiring from this position at the end of this month. Mr. McCauley is going into business for himself and will use the name and style of R. J. McCauley, Sanitary and Heating Engineer.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription: Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CARET ADDRESS
Macgubbe, Toronto, Atsrek, London, Eng.

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Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, MARCH 1, 1913

The Drain Question

By-laws in Toronto with regard to plumbing as they read to-day allow either tile pipe or soil pipe for sewage connections under buildings. During the past year a special committee have been looking into the matter and have now brought in a new bill before the council permitting the use of tile pipe for sewage drains only under wooden sheds and stables. Under houses, office buildings, factories, etc., all sewage drains, according to the new bill are to be of soil pipe. This bill has already passed a second reading and comes up for final discussion on March 10.

The struggle for soil pipe vs. tile pipe is one in which every plumber should take keen personal interest. It is not a matter altogether of commercial importance. That feature may be almost altogether disregarded as the difference in price in the average house is only a matter of \$12 to \$15 and this means a difference between a good permanent job which will stand jolts and straining without breaking and allowing sewer gas to escape, and a job which, submitted to jars, vibration or strain, will crack at joints, allowing the poisonous gases of the sewer, it is claimed, to make their ways up into the house and endanger the lives of the occupants.

The argument for the introduction of soil pipe to the exclusion of tile pipe is one altogether of sanitation. Joints being of lead instead of cement are less rigid; joints will not break by settlement; hubs will not be forced off by expanding of joints and thus prevent leakage; there are only one-third of the number of joints in iron pipe as compared with the tile pipe, thus chances of obstructions at joints are reduced to one-third; material in soil pipe is not so liable to injury by rough usage; alterations can be made more easily with soil pipe and with more security. These and others show the increased sanitary advantages of soil pipe.

Other cities have long since recognized the superiority of soil pipe. Apart from Toronto and Hamilton which in this regard are very far behind the times, there is scarcely a city of any importance in Canada which permits tile pipe to be used. In Germany and England, where the best tile in the world is made, it is allowed to be used in sewage drains but only when laid on a slab of concrete. In Cleveland where the best tile pipe in America is made it is not allowed to be used for sewage drains under any condition. In 1887, about the time when other cities were excluding tile pipe, Toronto passed a by-law allowing either tile or soil pipe to be used. Amendments were made to this by-law by doctors in 1901-2-3 and 4, but only small technical points were altered. Plumbers! As sani-

tary engineers, its up to you to take an interest in this question, put your whole weight behind it, and never let up till you succeed in having passed a by-law in the best interests of the health of the city of Toronto.

As for durability, the one pipe will last as long as the other, but what about the joints? Other cities have given iron pipe a long continuous test and find it satisfactory in every respect. Some of the more prominent cities which have allowed only iron drains for sewage under buildings and the length of time in each case are: New York, 25 years; Baltimore, 29 years; Cleveland, 22 years; St. Louis, 27 years; Buffalo, 17 years; Philadelphia, 24 years; Detroit, 30 years; and Washington, 25 years. Toronto has permitted the use of both for the past 26 years. The question is not at all a commercial one, but one of sanitation in every respect.



Remedy Needed Here

Should a plumber be held up on his job and kept in a position where he is unable to make collections through the work of another contractor? Where a plumber is awarded the contract for laying the tile pipe as well as installing the plumbing, it is only proper that he should make tight the whole job. It often happens, however, that the contracts are let to two men, and that the tile man has his work finished and received payment before the plumber is ready for a test. The by-law in Toronto requires that a smoke test be put on when the plumbing is completed, and here plumbing is taken to include everything from the breather to the roof. In cases where the tile man is careless and not particular to give the plumber a square deal, the plumber is forced by the city authorities to make the whole job tight whether leak be in tile or plumbing contract. Thus a plumber may be compelled to return to the job time and time again to fix another man's work. He can count on every test costing about \$5, and although he knows his own work is perfectly tight from tests he has himself applied, he cannot receive his certificate and demand payment. Where payment has been received he is often careless about making tile work tight and receiving a certificate, but where the architect insists on a certificate before payment, it is up to him to see that the whole job is right.

The situation is an unjust one from the outset, and why sanitary engineers should endure it is a mystery. Is it reasonable that a plumber should be held up by another man's work? Here again is a chance for organized efforts to better conditions.

A Short History of Sanitation

J. T. Aggett Reads a Highly Interesting Paper Before the Members of the Toronto Society of Domestic Engineers—Traces in Scholarly Way the Progress of Sanitation From the Earliest Ages Up.

The first meeting of the Toronto Society of Domestic Sanitary and Heating Engineers, devoted entirely to development along educational lines, was held in Albert Williams Cafe on February 20. The main feature of the evening was a paper on the History of Sanitation, compiled and read by John T. Aggett. In this Mr. Aggett dealt with the development of sanitation from the earliest days up to the present time, and presented a very instructive paper throughout. Wm. Mansell, of the firm of Purdy, Mansell, Ltd., then read a paper on "Water: Its Characteristics and Uses." Mr. Mansell laid particular stress upon the importance of water to the sanitary and heating engineers, and pointed out that without it or an equivalent there would be no call for a trade such as both plumbers and steam-fitters have established.

This is the first of a series of educational social evenings, and showed clearly not only that the meetings would prove of great value, but that outside talent was not a necessity in order to render the evening's programme interesting and highly instructive.

Before closing, President Waterman spoke briefly on the necessity of stronger organization. The society, he stated, had failed to gain a representative on the Board of Health, and also on the Council through improper organization, and through lack of co-operative work amongst the members. He urged that each get busy now and see what could be accomplished with the combined efforts of all.

Address on Sanitation.

Mr. Aggett said in part:—The march of progress is onward, but it moves in cycles. A centre of civilization springs up, flourishes for a time, then decays, and from the ashes of the perished civilization there springs a larger, grander, and more enduring civilization. Nowhere is this cycle of progress more noticeable than in the history of sanitation. Centres of civilization like Jerusalem, Athens, Rome and Carthage, arose to pre-eminence in sanitary matters—built sewers, constructed aqueducts, and provided for the inhabitants magnificent baths, the equal of which the world has never since seen. After the splendor of Carthage and Rome, darkness succeeded, a darkness from which we slowly emerged in the sixteenth century, and we are now speeding on to eclipse the sanitary splendors of even the old Roman Empire.

In its broadest sense a history of sanitation is a story of the world's struggle for an adequate supply of wholesome water, and its efforts to dispose of the resultant sewage without menace to health or offence to the sense of sight and smell. In the early days of primitive man sanitation was among his least concerns. He obtained water from the most convenient source, and disposed of his sewage in the least laborious way. Those who lived in the vicinity of streams solved the problem by moving to the banks, where, like their more civilized descendants of today, they drew water from the upside of



JOHN T. AGGETT.

the stream and returned the sewage to the water, to pollute and possibly contaminate it for their neighbors lower down.

Our present elaborate system of water distribution was of humble origin. It was not a rapid growth, but a gradual evolution. Its four principle stages were:—First, distribution from natural source by water carriers; second, aqueducts conveying water to communities where a system of sub-conduits conveyed the water from the main aqueduct to reservoirs in different parts of the city; third, a system of distributing mains through which water was furnished to householders at certain hours only during the day; and fourth, our present system of continuous supply at all hours of the day and night.

In the first stages of water distribution water was carried on the backs of water carriers in earthenware jars constructed especially for the purpose, or in goat or other animal skins properly

tanned and sewed to hold water. This method is of great antiquity, and is still practised in most tropical countries, and water carriers may be seen in both Mexican and Egyptian cities. The earliest record we have of any effort to supply any community with water conveyed in a tunnel or aqueduct from a great distance, dates from the year 727 B.C. in the City of Jerusalem by King Hezekiah, who reigned at that time. In 625 B.C. the Greeks constructed a tunnel eight feet wide by eight feet high and 4,200 feet long, through which was built a channel to supply the City of Athens with water. The first aqueduct to be built by the Romans was in the year 312 B.C. While the ruins of the aqueducts and tunnels at Jerusalem, Athens and Carthage gives some idea of the skill and knowledge of hydraulic and sanitary matters possessed by the engineers of that period, we must turn to Rome and study their system of water supply, drains for sewage, and the ruins of their magnificent baths, to form a true conception of the skill of the early Roman engineers and the lavish expenditure of money to secure a proper water supply for Rome.

In 272 B.C. we read of a tunnel or aqueduct to carry water a distance of forty-three miles. This aqueduct was constructed of stone and the channel was lined with a thick coat of cement, which was no doubt Pozzolana cement made from rock of volcanic origin, which, upon being pulverized and mixed with lime, possessed the valuable property of setting under water, and there is no doubt that were it not for this natural cement the construction of aqueducts and channels for the carrying of water would have been more difficult to accomplish by the ancients. We read of others constructed to a length of sixty-five miles, but their great trouble appears to have been that the water was of such bad quality as to be scarcely fit for drinking. The per capita daily supply of water to the City of Rome was about one hundred gallons. With a population of one million people such enormous quantities of water could not be poured daily into a limited area without some material and physical injury resulting if provision were not made to dispose of the surplus. Hence, it was that a system of drains was evolved in Rome which, while not the first in point of time, nevertheless were the only ones known to have been constructed by the ancients, until within a comparatively

recent date ruins of sewage systems were unearthed in Bismya, an ancient Syrian or pre-Babylonian city.

It might be as well now at this stage to say a few words bearing upon these early drains, or perhaps to go further back still and take a glance at the efforts made even prior to that time to dispose of excreta and other household wastes. It is in Deuteronomy, one of the Books of Moses, that first mention is made of the disposal of excreta. I shall not give you, Mr. Chairman and gentlemen, the chapter and verse, nor will I read you the verses pertaining to this matter by Moses, as I feel sure that you all take a deep enough interest in this subject to look it up for yourselves, but I will say that there is no doubt that the object of Moses in laying down the law which he did was to preserve cleanliness about camp, and to hide offensive matter from sight in the least odorous way. Nevertheless, no more sanitary method could have been adopted. Deposited as the soil was in small quantities just under the surface of the ground, it was soon reduced to harmless compounds by the teeming bacteria in the living earth.

Recent explorations in Jerusalem have brought to light extensive drains for the removal from the vicinity of the temples of offensive matters peculiar to the bloody sacrifices of that ancient people, and in an August, 1905, issue of the Scientific American Mr. Edgar James Banks, a director of the Babylonian Expedition of the University of Chicago, gives a very interesting description of house drains and sewage disposal wells constructed at Bismya some 4,500 years ago. I will give you an account taken from that article as to how the ancients in Babylonia took care of the sewage of a house or build-

the time I speak of is some 6,000 years ago:—"Babylonia is perfectly level, and from Bagdad to the Persian Gulf there is not the slightest elevation, save for perhaps an occasional sand drift. In most places there is a crust of hard clay upon the surface baked by the hot sun of that country so hard that it resembles stone. Beneath this crust of clay which in some places is seldom more than four feet in thickness and in other places entirely lacking is loose eaving sand reaching to an unknown depth. Drainage in such a country without the aid of running water might tax the ingenuity of a modern builder. In constructing a house, the ancient first dug a hole in the sand to a considerable depth. Several instances have been found where the excavation had reached the great depth of forty-five feet beneath the foundation of the building. From the bottom he built up a vertical drain of large cylindrical terra cotta sections,

each of which is provided with grooved flanges to receive the one above. These sections are about twenty inches in diameter and twenty-four inches in height. Some have been found very much larger in diameter, but shorter, and, Mr. Chairman and Gentlemen, I would like to say here that these terra cotta sections must have very closely resembled the large sewer pipes commonly in use to-day—but to proceed, the section at the top of the drain was semi-spherical, fitting over it like a cap, and provided with an opening to receive the water from above. The vertical tiles were punctured at intervals with small holes of about three quarters of an inch in diameter, coarse sand and broken potsheards were then filled in round about the drain and it was ready for use. The water pouring into it was rapidly absorbed by the sand at the bottom, and if there it became clogged the water escaped through the holes in the sides of the tiles. One palace was discovered with four such drains, which to my mind Mr. Chairman and Gentlemen must have very closely resembled what is known to-day as a leeching chamber, and which are in common use and give very good satisfaction in sandy ground. There was discovered a very large bath resembling a modern Turkish bath and provided with a tile floor sloping to one corner. This bath emptied its waste into one of these drains, but we are not told of any such thing as a trap being used to hold back the obnoxious gases. The toilets in the private houses of six thousand years ago were almost identical with those of the modern Arab house, a small oblong hole in the floor without a seat. Several of these fixtures have been found with vertical drains beneath. In one of the temples constructed two thousand seven hundred and fifty years B.C. there was discovered a horizontal drain of tile, each section of which was about three feet long and six inches in diameter, and very much like in shape those at present employed. It conducted the rain water to one of the vertical drains."

The first sewers of Rome were built in 800 and 735 B.C. and therefore were in use nearly five hundred years before the water supply by aqueduct was first built. It is therefore evident that as originally planned the sewers of Rome were intended to carry off surface and storm waters, and in other ways served to drain the site of that ancient city.

That the engineers who designed the sewage system of Rome had a clear conception of the service expected of such drains is evidenced by the manner in which the system was proportioned. The pipes gradually enlarged from their extremities in the buildings through all

the ramifications of the system until they finally reached the outlet at a bulk head in the Tiber. It is stated by early writers that so complete was this system of sewers that every street in the ancient city was drained by a branch into the Tiber. One of the largest of which we have record, and it is also one of the most ancient and celebrated of sewers, has been in uninterrupted service for over two thousand four hundred years, and at the present time is still in use with no sign of immediate failure. The arches were made of neatly jointed stones fitted together without cement.

It is stated that a cart load of hay could pass down this sewer. It should be born in mind, however, that a Roman cart and load of hay were of smaller dimensions than a modern one. The actual dimensions of the mouth of the sewer are eleven feet wide by twelve feet high. The lateral branches of the main sewer were of a size in proportion with these requirements, and in proportion to the main or trunk sewer. The dimensions of these sewers are evidenced by the service they performed for Nero, who threw into them the bodies of the unfortunate victims of his nightly riots. Now while each street in Rome was provided with an adequate sewer it is more than probable that only a small percentage of the population had branches extending into their houses. In those that had, the Latrines were located adjacent to the kitchen, where through the untrapped end of the sewer noxious gases were continually arising to vitiate the surrounding air. The only ventilation the sewers of Rome had was through these untrapped ends. Many of the houses of Rome were lofty and inhabited near the top by the poor, as the drainage systems were not extended above the first floor they had very imperfect means for carrying off rubbish and other accumulations. A practice seems to have grown up then of throwing such liquid and solid matter from the windows, sometimes to the discomfort or injury of hapless pedestrians passing below. To provide against accidents due to this cause an act was passed which gave damages against a person who threw or poured out anything from a place or upper chamber upon the road frequented by passers by, or on a place where people used to stand. This act, however, gave damages only when the person was injured, but nothing was recoverable if the wearing apparel was damaged. A strange provision of this act was that it applied only in the day time and not to the night, which, however, was the most dangerous time to the passers by.

The value of bathing for pleasure, cleanliness and health, was early realized by the ancients, who in many cases

made the daily bath part of their religious ritual, with the hope of thus inducing a practice that would from constant observance become a habit not easy to overcome, and which would be a lasting benefit to the health of the individual and a safeguard to the community.

The Greeks were among the first to introduce bath tubs and these bath tubs were made of polished marble, shaped something like a punch bowl, stood about thirty inches high and were not occupied by the bather as in a modern bath tub. It is known that they had public baths for men and women. The Greeks considered it effeminate to use warm water and consequently their bathing establishments never attained the luxury and splendor that latterly marked the Roman baths. When bath tubs were first introduced into Rome the wealthy people fitted up their houses with a bathroom much as do the people of our own time. Some of the public baths were very large and could accommodate three thousand and two hundred bathers at one time. The most famous baths we read of were built by the Romans in 212 A.D. Space does not permit me to give you the description of the Roman baths which I would like, but it is sufficient for me to say that they had means of making warm water, and also overflow and waste pipes. In some instances a great deal of money was spent by the wealthy Romans in connection with these bathing establishments, but during the period following the fall of Rome the Empire was over-run by barbarians from the north, and the magnificent baths, aqueducts and public edifices reared by the Romans with such painstaking care were suffered to fall into decay, in fact so bad did the conditions become that the conquered people forgot the uses to which the old works had been put. Following the fall of the Roman Empire there was a period for over one thousand years of intellectual darkness during which no material progress was made. This period was called the dark ages, and sanitary conditions we are told became so bad that it ultimately resulted in scourge after scourge of filthy diseases sweeping over the continents of Europe and Asia and claiming over forty millions of victims, all due to the unsanitary conditions that prevailed, and it was not until about the end of the sixteenth century that general improvement began to be made in sanitary matters, and it was not until the year 1235 that small quantities of spring water were brought to the City of London, England through lead pipes and masonry conduits.

The first pump was erected on the old London Bridge in 1582 for the purpose of supplying the City with water from

the Thames and distributing it through lead pipes. The oldest print of a steam engine is shown in the Birmingham public library and shows a machine built in 1712 which they called "the engine for raising water by fire."

Also about 1700 a Frenchman invented the hydraulic ram, and it is not until the year 1800 that we read of the first water works and pumping station which were erected in the City of Philadelphia, the pumps and boilers were of the crudest design. The water mains used in Philadelphia were made of spruce logs reinforced at the ends with wrought iron bends. A section of one of these water mains, still in a good state of preservation, is on exhibition in the Builders Exchange of that City.

So far as is known Philadelphia was the first city in the world to adopt cast iron pipe for water mains. This was in the year 1804, and a few years later London, England, commenced to use the same material. Wooden pipes were quite common up to 1896, and when dug up at that time were found sound and good for many years service. Constantinople still receives part of its water supply through a wooden pipe. Hydrants and valves used in connection with these wooden pipes were made of metal. Only one brief century has passed since water works pumping stations were introduced, but wonderful improvements have been made within that short space of time, and we now have pumping engines which will work continuously month after month and deliver daily many million gallons of water.

In 1852 we read of the formation of the first general board of public health which made their report to the British Parliament, and they recommended strongly the use of earthenware pipes for house drains and public sewers in place of large brick and stone drains then in use for house drainage. The sewers of Paris, France, were first constructed in 1663, and are world renowned. The sewers of Paris to-day aggregate over 750 miles in length and constitute one of the sights of the city, and it is quite common for visiting parties to be accommodated in boats which are quite large and comfortable. The great sewer is tunnel-like in dimensions, being sixteen feet high and eighteen feet broad and on occasions of a visit lighted with lamps alternately red and blue which stretching away in the distance have a very striking effect. On either side of the sewer may be seen the large mains carrying the city water supply and also the telegraph cables. But it is not until about 1855 and 1857 that we have any reliable data concerning the construction of sewers on this Continent, but in the half century in-

tervening since that time we have seen the development of sanitary engineering, and have witnessed the installation of sewer systems rightly proportioned and properly designed in almost every city and town in the United States and Dominion of Canada, while text books on engineering contain all necessary information for their design and construction.

No history of sanitation would be complete without touching upon the plumbing fixtures in buildings and showing the marked progress along these lines within the last quarter of a century.

It is only a little over a century and a quarter since the first English patent was granted for a water closet. That was in the year 1775, and was issued to a man named Alexander Cummings, who, strange to say was a watchmaker. This closet was the first one patented which had what was known as a trap to contain water for a seal. Three years later a patent was issued to Joseph Bramah for a water closet with a valve at the bottom. Very little progress was made during the next fifty years, and then in the year 1833 the first American patent was taken out and the art had not advanced very far. Indeed, it might be said that the Fraim patent for a syphon closet was the first real cleanly and sanitary type of closet that was put on the market. Bath tubs and lavatories have improved quite as much in appearance in the time that has elapsed, as have water closets. The earliest baths of which we have any knowledge were hewn out of marble and later when bath tubs came into extensive use they were made of wood, lined with either sheet zinc or copper, tinned on one side, and it is only within comparatively recent years that porcelain enamelled tubs came into use, and that porcelain enamelled tubs were manufactured in this country. Open plumbing was unheard of twenty-five years ago, and at that time plumbing fixtures and pipes were all boxed in. Wash basins were made of marble. In about 1902 the modern fixtures commonly used to-day began to take the lead, and the old style of baths and basins are as much a curiosity to-day as an old pan closet. Events of to-day become the history of to-morrow, so it is with sanitation. We of the present age believe, as did those of a generation ago, that we have almost attained perfection in the manufacture and installation of plumbing fixtures. But have we? or will succeeding generations look back upon what we consider good as we look upon the fixtures in vogue in the early seventies. This we do not know nor can we foresee. Time alone will tell.

The Properties of Water and Steam

Wm. Mansell gave the following address on "Water and Steam":

After due consideration as to what topic of trade would be interesting and not too dry a subject, I decided upon a short paper on the word water, or as the dictionary explains it—a colorless odorless transparent fluid, consisting of two volumes of hydrogen, to one of oxygen.

Water is without doubt one of the most useful elements in the arts and manufacture. Water is one of the oldest divisions of this globe. It does not spontaneously undergo any perceptible change; remains liquid in the common temperature of the atmosphere; becomes solid at 32 degrees of Fahrenheit, and is converted into vapor at 212 degrees, but resumes its fluidity on being reduced to any intermediate degree. Water is compressible and is perfectly elastic, but the change is so minute as to have no practical consequence. Water expands in passing into the solid state about 8.5 per cent. of the volume of water, one cubic foot of water weighs 62½ lbs. and contains 1.728 cubic inches or 7½ gallons, one cubic foot of ice at 32 degrees weighs 57½ lbs., and therefore floats in water at any ordinary temperature.

Perfectly pure water is not palatable, and it is the business of the chemist to distinguish between those substances, and those amounts of certain substances, some of which render water unfit for domestic use, while some render it safely potable, gross pollution may be quite easily detected, but the dangerous border line between health and disease is not always easily established.

Untoasted perhaps, a water unfit for drinking by reason of contamination, will be thin, dull, bright and sparkling, and have no unpleasant taste.

A well in a thickly settled community should always be regarded with suspicion, and even an isolated farm house may have its highly valued well poisoned by means of some unsuspected underground connection with a barn cellar, a privy vault or cesspool. When a well is pure and free from contamination, there is no water equal to that found in the old-fashioned bucket. The question of examination of water has recently become an important and valuable ground for the determination of its quality.

We do not know the form of the parts of which water is composed, and can only imagine its nature in relation to its primary particles. There is more difference in accuracy and in the apprehension which is necessary in the progress of human life, than that which ought to satisfy the in-

vestigation of a philosopher. Thus there is nothing more obvious to common observers, than fluidity, yet the philosopher finds it a property difficult to be conceived, and which he could not give credit to, if it were not rendered familiar to him by custom and experience. It is a physical phenomenon, which has not been explained, and of which it is very difficult to give a clear account. It is indeed impossible to comprehend, how a material and compressible substance can be composed of parts so elementary so moveable among themselves, and yet with so little adherence as to assume immediately the form of any vessel into which it is poured; that its surface is always parallel to the horizon, or perfectly level that it runs off where favored by the smallest descent.

Water may be divided into several classes—fresh, saline, mineral. Saline



WM. MANSELL.

or sea water is derived from the different seas which surround the globe. Mineral waters are distinguished from common water by a peculiar smell or taste, There is another water commonly known as fire water. This, if taken in any quantity, is liable to make an Indian out of you.

Water, we must admit, is necessary for our existence, not only physically, but practically.

Where would be our calling as Sanitary and Heating Engineers without water? Water we must have to live, and without water the Commerce of the whole world would be at a standstill. It brings into being the motive power on sea and on land. It is being harnessed and controlled in almost every conceivable way for the advantages and benefit of mankind. It gives us a commodity with

which we qualify as sanitary engineers, by demanding of us the best and most sanitary applications of it in all our dwellings, work shops, and buildings. It demands that each of us must carefully guard its purity, and chastity. It makes of us guardians of the health of our neighbor, in the proper instalment of everything connected with it from its source of supply to its liberation. It make us better and cleaner by its application, even to the fulfilment of the old proverb, "cleanliness is next to holiness."

I don't think we value the water we have. We think the water supply as plentiful, as the air supply. We give no thought to water dripping from a leaky tap, or running into a closet tank. We don't imagine that a 1-16in. hole in a water pipe under a pressure of 45 lbs. will waste 432 gallons in twenty-four hours, or that a hole 1/8in. in diameter in a pipe under 45 lbs. will waste 4,610 gallons in 24 hours, or that 1/4in. hole in a pipe will waste 12,960 gallons in 24 hours at a pressure of 45 lbs. Just try to consider the amount of water that is wasted by leaky pipes, taps, etc., in Toronto every 24 hours and at what a cost to the tax payer. Just try to consider the vast amount of water that is lost through leakage in the city of New York yearly.

Take New York city for example, thanks to its prodigal water waste, the tax payers must pay \$260,000,000. for a new system of supply, and \$10,000,000 more for a tunnel to carry it from the reservoirs to its distributing head. The city of New York is spending on its new water system more than the United States Government is spending on the Panama Canal.

Now fellow engineers just a few more words before closing. We, as heating engineers, are just as closely interested in water as are the sanitary men.

Where would we be at in the heating business if we had no water? If we had no water we could have no steam. Now just about a minute to know what steam is.

The vapor arising from water at its boiling point,—called steam—is a chemical compound. Eight parts by weight of oxygen to 1 of hydrogen steam proper is perfectly transparent and colorless, dry, and only moist when condensed; wholly invisible, and when apparent, only so by reason of partial condensation. Its density is equal to the pressure of the atmosphere, or 14.82 lbs. per square inch and unless confined, the temperature of water cannot be raised above the boiling point 212 degrees.

When steam is generated in a boiler, the water is heated until it arrives at the temperature of ebullition, and the elevation of temperature is sensible to the thermometer; next the water is converted into steam by an additional absorption of heat which is not measured by the thermometer, and is, therefore, called latent heat. The heat is not in fact latent, but is appropriated in converting water into steam, of the same temperature.

The pressure, as well as the density of steam which is generated over water in a boiler, rises with the temperature and reciprocally the temperature rises with the pressure and density.

There is only one pressure and one density for each temperature; and thus it is that steam produced in a boiler over water is always generated at the maximum pressure and maximum density corresponding to its temperature.

In such condition steam is said to be saturated, being incapable of vaporizing more water into the same space, unless the temperature is raised. Saturation is therefore the normal condition of steam generated in contact with a store of water, and the same density and the same pressure are always to be found in conjunction with the same temperature. In consequence, saturated steam over water stands both at the condensing point and at the generating point; that is it is condensed if the temperature falls, and more water is evaporated if the temperature rises.

But supposing the whole of the water to be evaporated, or that a body of saturated steam is isolated from water,

in a space of fixed dimensions, if an additional quantity of heat be supplied to the steam, the state of saturation ceases, the steam becomes super-heated, and the temperature and the pressure are increased, while the density is not increased. Steam thus sub-charged with heat, approaches to the condition of a perfect gas.

The great salt lake in Utah is different from any other water in the world, with the possible exception of the Dead Sea, and the points of similarity between the great salt lake and the Dead Sea are fewer than is generally supposed.

The Dead Sea is more salt than the great salt lake, it has a depth of hundreds of fathoms in some parts, while Utah's water wonder has an average depth of about eight feet, and is nowhere more than thirty-three feet deep, but the most striking difference lies in the fact that the surface of the Dead Sea is some thirteen hundred feet below sea level, while the great salt lake is more than four thousand feet above.

Sea air at a mountain altitude sounds paradoxical, but this is the anomaly offered at Saltair, the famous bathing resort a half-hour's ride from the Zion city of the Mormons. The lake is like an intensified bit of the ocean, deposited by some high tide into a pocket among the mountains, it is bluer than the ocean at its bluest, and the sunset dyes it deeper at evening. A bucket of sea water would have to evaporate until only about one-seventh of it remained before it would be as salt as the water of the great salt lake.

than last quoted and primary iron markets are quite strong.

TORONTO.

Toronto, Feb. 28.—Business during past couple of weeks is reported as brisk and well in advance of corresponding season in other years. The old story of demand in lines such as soil pipe, iron pipe and radiators being greater than supply still holds true. In fact, indications for any other condition are few, except in iron pipe which now gives promise of better deliveries in the near future.

With the various reports of the stringency of the money market floating round, some of the jobbing houses have begun to settle down harder on their customers and demand payment at definite dates. With heavy demand in all lines they know that they can sell their goods anyway and with signs of money being scarce are protecting themselves by looking after collections more closely. Collections so far are said to be very fair, and well up to other years in every way.

Enamelware.—General firmness continues to prevail in all lines of enamelware and goods are moving out very freely. Jobbers and manufacturers alike are waiting for President Wilson to outline his policy. Conditions at present in the States are very unsettled, and until the new policy is outlined are likely to remain so. So far as can now be judged, prices in enamelware are likely to continue much the same as at present, but nothing definite can be stated.

Iron Pipe and Fittings.—Prospects are for better deliveries in iron pipe in near future. Stocks are now in much better condition, and with demand easing off slightly it will soon be possible to secure shipment when desired. Prices continue unchanged as follows: 1 inch galvanized pipe, \$6.19; 1 inch black pipe \$4.54; cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bushings, 65 per cent. off; malleable iron bushings, 65 per cent.; nipples 75 per cent.; headers 60 per cent.; flanged unions 65 per cent.; malleable lipped unions 65 per cent.

Soil Pipe.—Scarcity still prevails, neither manufacturers nor jobbers as yet being able to supply all the orders coming in. Prices continue unchanged at medium and heavy, 60 and 5 per cent. off; 7 and 8-inch sizes 45 per cent. off.

Lead Pipe.—Market continues dull and little business is being transacted. Conditions are expected to remain same until new work commences in the spring. Prices continue unchanged as follows: lead pipe 15 per cent. off; lead waste, small lots 6c per lb.; quantities 5½¢.

(Continued on page 19.)

Plumbing and Heating Markets

MONTREAL.—Plumbers advise good business at the present time. The business is mostly new work which had been left over from last year. The mild winter has had the effect of cutting down repair work due to frozen pipes, etc. The outlook for the coming season is very bright and plumbers and steamfitters here are looking for a big business this year. Montreal is planning for many new buildings. It is reported that thirty-eight ten-storey buildings will be erected here this coming summer. This speaks well for the growth of the city.

Soil Pipe.—Prices remain practically the same as last quoted. Medium and extra heavy pipe up to 6 inch, 60 per cent. off list; 7 and 8 in. pipe, 45 per cent.; medium and extra heavy fittings, 70 per cent.; light pipe, 60 per cent.; fittings, 60 and 5 per cent. The demand for soil pipe is extra heavy and as the mills are running full blast to keep up with present orders, it looks doubtful

whether dealers who order their supplies late will be able to get supplies when wanted. Manufacturers advise early buying. It is simply a case of "Come early and avoid the rush."

Boilers and Radiators.—There is still a shortage in radiators, but manufacturers are beginning to get the decks cleared. The present weather is very favorable to this end. It is certain that there will be a big demand for radiators and boilers again this season.

Solder.—Prices remain firm at bar, half and half, guaranteed, 30½; wiping, 28½.

Lead Pipe.—There is a quiet demand for lead pipe at present owing to the mild weather.

Prices are as follows:

Lead pipe, 7½¢, 15 per cent. off; lead waste, 9c, 15 per cent. off; traps and bends, 30 per cent.

Iron Pipe.—Prices are a little stiffer



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

SURFACE COVERED BY 1 LB. OF BRONZE.

Editor, Plumber and Steamfitter. — Will you be kind enough to tell me how many feet of radiation one pound of bronze will cover? — Helper.

It is stated by those who have been at the business for years that, under ordinary circumstances, one pound of gold bronze will cover some 150 feet of iron surface that has not been primed and about 200 feet of primed surface.

Aluminum bronze will cover from 350 to 400 feet of surface.—D.C.H.

LOCATION OF THE ALTITUDE GAUGE.

Editor, Plumber and Steamfitter. — When two hot water boilers are connected together on one job where should the altitude gauge be connected so as to give the right result? Gauges.

Connect the altitude gauge so that it can be easily seen from the front of the boilers and to the main that takes the outlet from both boilers. Boilers "Twinned" after this way are generally supplied with valves so that neither boiler may be shut off at the will of the fireman.—D.C.H.

CUTTING THROUGH CEMENT FLOORS.

Editor, Plumber and Steamfitter. — We have had some work to put in in some cement buildings, and as we got in late, we had an unusual amount of difficulty in getting the holes cut to run our pipe line. It took more than double the amount of time we figured for the work, and we wish to ask you if you know of any means by which this class of work can be accomplished to greater advantage than by just using a hammer and chisel? — P. M. & Co.

It is said that coming events cast their shadows, and here is one with which the plumbers and steamfitters will have to reckon in the future. The building of cement dwellings, stores, factories, etc., has been increasing greatly in the past five years, and bids fair to increase far more in the future. The work of installing heating or plumbing in a cement building has been found

by some to run to 60 per cent. more than when put in an ordinary building. We observed something the other day that may be of assistance where the installation is of a size to warrant the outlay. Oxygen acetylene torches were used in dismantling a sky scraper. These torches speedily cut through the iron beams, and also were used on the concrete flooring, cutting through eight inches of concrete in about 40 seconds. It occurs to us that if this form of torch is so efficient in tearing down a building, why would it not be of equal use in slicing out places to run the pipe lines where

the waste would probably increase unless great pains were taken by the inspectors.

In a recent instance, where a certain section of a city was taken as an example and a test made, it was found that in a district one mile square there were over 4,400 leaks from closets and various other sources.

When the leaks were stopped the total supply for this same district was found

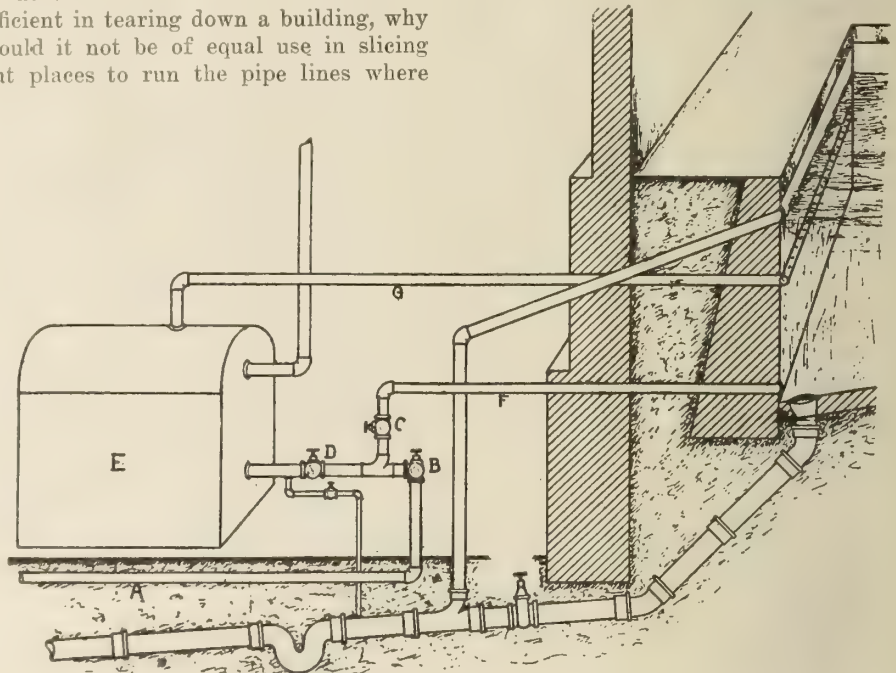


Fig. 1.

they must be run through the concrete? If they will go through concrete in the time mentioned, it would be easier than cutting wood. We offer this suggestion to those who might use it.

D. C. H.

THE WASTE OF CITY WATER.

Editor, Plumber and Steamfitter. — Can you give me any figures on the amount of water that might, on the average, be wasted in any city of considerable size? — Curious.

In a new or comparatively modern system the waste would most probably be comparatively small for the first few years, but as the plumbing became older

to be reduced over 5,000,000 gallons per day, which amounted to something like \$55,000 a year.

Besides the saving in dollars the water pressure in the district was increased about ten pounds, a matter of no small moment in a large city where high pressure was not used.

D. C. H.

THE WALLS OF THE BATH ROOM.

Editor, Plumber and Steamfitter. — Would it be considered sanitary to have the walls of the bath room papered? — P. B.

The ordinary kind of papering we should consider as not the most sani-

tary. There is a glazed waterproof paper that is used especially for this purpose, and we would recommend its use rather than the paper of the ordinary kind. The walls of the bath room should be so equipped that they can be washed with soap and water several times in the course of the year. A plastered wall painted with three or four coats of heavy paint will answer the purpose. A plastered wall is always, however, liable to crack and break and so, if the expense can be stood, a tiled wall of some kind would be far better. It is once in a lifetime, anyway, and so the matter of the thing that will last the longest and be the best should be most carefully studied out.

D. C. H.

WHERE LOW FIGURES FAILED.

Editor, Plumber and Steamfitter.—I lost a heating job last fall and another party got it at higher figures than I submitted. I gave the figures to the customer right in his own house and the other fellow submitted a printed estimate. Now, why would the customer take the higher figures? It is not usually so.

B. B.

Perhaps the customer was one who had "been there" before. Also he might have been wise to the fact that not one in 1,000 can sit down away from the shop and figure out a job and not leave some items out that would cause trouble afterwards.

Your plan is all wrong (under general circumstances) anyway. At the best you could have given only a lump bid, and many of the people have learned that such bids are mighty poor

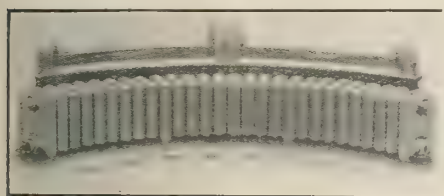


Fig. 2.

things to tie to. A handy blank estimate book carried in your pocket might have enabled you to hit the mark with some degree of success.

D. C. H.

GETTING LIGHT INTO THE BATH ROOM.

Editor, Plumber and Steamfitter.—The window of a certain bath room opens into a well hole between two buildings and the bath room is quite dark. Can you give me a pointer as to how I can get any more daylight into the room?

Rooms.

We believe that in cases of this kind it is customary to make use of prismatic windows and reflectors. We would suggest that you take the matter up with some first-class architect and see just what he can do for you along the matter suggested.

D. C. H.

WHY IS IT THAT THE PLUMBER IS ALWAYS "CUSSED"?

Editor, Plumber and Steamfitter.—Other mechanics don't seem to get found fault with and "roasted" like the plumber does. Now why is it that he, in particular, should always be the "goat"?

Plumber.

For one reason, because those engaged in it seem to regard it as a trade instead of a business that adds greatly to the amount of health, comfort and happiness. If the plumber will talk along a line that will lead people to see that he is adding permanently to the good, the value and the decency of the community, in time he will cease to be regarded, as he is sometimes at present, by unthinking persons.

D. C. H.

HOT WATER CAPACITY FOR THE EXTRA BATHROOM.

Editor, Plumber and Steamfitter.—There is a certain house that we are going to fix over the plumbing in and an extra bathroom will be added. Now can you tell me whether or not the capacity of the range boiler should be increased, and, if so, about how much?

Fixer.

You do not mention the size of the present range boiler, but, assuming that it is of the ordinary kitchen size (from 30 to 40 gallons' capacity), we should say that you could add a range boiler that would contain some 30 gallons more than the one now in use.

D. C. H.

HEATING A SWIMMING TANK.

Editor, Plumber and Steamfitter.—Will you kindly tell me a good easy way to heat a swimming tank and be sure that it works?

H. H. G.

We show a cut of an easy manner that has been tried out and is recommended by one of the authorities on the subject. In Fig. 1, A represents the supply pipe, B an angle valve and C and D gate valves. G and F are supply and return pipes from the boiler E.

D. C. H.

ARE OIL BURNERS IN STEAM BOILERS SAFE.

Editor, Plumber and Steamfitter.—In some places I have observed oil burners of certain types placed in a fire box of a boiler used in heating a building by steam. Do you regard them as

being as safe as other fuels used for making steam?

B. B.

Properly installed, we cannot see why any of these oil heaters should be dangerous. We can conceive of different ways in which such a job might be put in by some inexperienced party in such a manner that the fumes from the oil might collect in the basement, and under certain circumstances cause an



Fig. 3.

explosion, but the same thing might happen to several different forms of lighting. Such classes of work should be installed by mechanics who know the business.

D. C. H.

PLUMBING AND HEATING MARKET.

(Continued from Page 17.)

Solder.—Demand for solder has been fairly heavy, although not so much so as in other years when colder weather prevailed, causing more bursting of pipes and thus more work for the plumber. Easy wiping is still quoted at 26 and half and half at 30.

Boilers and Radiators.—Stocks in boilers are now fairly good so that almost no difficulty is experienced in securing these, but in radiators scarcity is still very marked. Lower sizes (running about 20 inches) are scarest and practically unobtainable; standard sizes, however, are to be had in much greater quantities.

Metals.—Brass is reported as somewhat easier, but as yet prices on brass fittings have continued unchanged. Copper has been declining lately, but it now looks as if present price of 16c is on rock bottom. Lead continues firm under pretty good demand. Iron and steel products are still in heavy demand and continue unaffected by recent fluctuations in ingot metals. Tin remains steady. Demand for small lots is good. Stocks are light.

Incompleteness of Plumbing Specifications

There is nothing entering into the construction of the modern building which is more intimately associated with the health and comfort of its inmates than the plumbing. Under this general term is included the drainage from and water supply to fixtures, the proper arrangement of all traps and vent lines, the heating of the water and the apparatus therefor, the proper installation of all plumbing fixtures, and such mechanical appliances as house and fire pumps, suction and supply tanks, etc.

The plumbing system for a building may be very aptly compared with the circulation and intestinal systems of the human body. The water supply lines are the arteries which carry the life-giving fluid to the remotest corners of the structure; the sewers the intestinal canal through which the waste matter is discharged.

Architects' Plans Lack Information.

Notwithstanding the important bearing of the plumber's work it is, as a rule, given very little study by the average architect in the preparation of his plans and specifications. He will elaborate most exhaustively on his construction and materials which go to make up the superstructure, making numerous full size detail drawings of doors, windows, interior and exterior trimmings and decorations, but when it comes to the plumbing, the most important of all from the standpoint of health and convenience, he is woefully lax in his instructions to the plumbing contractor. And it is greatly to the credit of the much maligned plumbing trade that such good work is produced with such meagre assistance as the plumber gets from his plans and specifications.

The architect in drawing up his contracts usually stipulates that the plumbing must conform to the drawings and specifications, which would necessarily imply that the drawings and specifications contained all the information that might be necessary for the plumbing contractor to not only give an intelligent figure on the work required, but also to carry out his contract in a manner to ensure the very best results obtainable. But let us turn to those same drawings and specifications, and what do we find? The average building plans show us a toilet room located here, a sink there, lavatories scattered promiscuously, with a few lines on the basement plan to indicate the general direction of the sewer, but nothing more. It is up to the plumb-

er to figure, if he can, how he is to reach the various fixtures with his lines; where to locate his water heater, pumps, tanks, etc.; where to install his risers and vent lines, and how he is to keep out of the way of the steel contractor, the heating contractor, the electrician, the sheet metal contractor, and, in fact, every other artisan on the job; for it seems to be the generally accepted rule that the plumber must give way to all of these more favored trades and crowd his work into impossible out of the way places, working under handicaps which would hardly be tolerated in other lines of building construction.

On the drawings he finds not a line to indicate where his water lines are to go or the size thereof; and as for locating his basement machinery, let him get along with whatever space the other contractors have no use for. The incomplete nature of the drawings is often-times to some extent recompensed by a carefully detailed specification, but, unfortunately, the specification is generally indefinite and inadequate, abounding in such terms as "pipes of ample size," "valves satisfactory to architect," "water heater of sufficient capacity," etc., thereby placing upon the plumber almost the entire responsibility for the designing and proper working of the system, and woe betide him should his judgment be at fault.

Meagre Details Prevent Close Figuring.

A case in point came to the writer's notice not long since. A large building involving more than the usual amount of plumbing was designed, and plans were submitted to some half dozen plumbing contractors with a request for bids on the work. Beyond showing the location of the various toilet rooms and the fixtures therein, there was not a line in the drawings to guide the bidder, and, as for specifications, there were absolutely none, each bidder being requested to submit his own specification with his bid. Each of the bidders, after spending a great deal more time in figuring the job than would otherwise have been necessary, submitted his proposition, but all to no purpose, as such a wide variation of ideas was found and such a lack of uniformity in the cost of the work that the designers were compelled to re-advertise for bids on a uniform and carefully drawn plumbing plan and specification.

What Plumbing Plans Should Show.

The plumbing for a building should be so indicated in the drawings and des-

cribed in the specifications as to cover everything required, and so clear and concise as to be readily understood by the average plumbing contractor. The positions of all mechanical appliances in connection with the plumbing should be clearly shown upon whatever floor plan such appliance may be located. All runs of piping through basement, together with the size of same, should be concisely indicated in the basement drawing. House traps, bell traps, area drains, sump pits, conductor lines, etc., should be located beyond dispute.

In addition to the plumbing lines shown on the plans there should be prepared a riser diagram showing the serving of each and every fixture on each floor of the building. This riser diagram should show clearly all water lines, waste lines, soil lines, vent lines, fire lines, etc., at each and every floor throughout the building, giving the relative position and arrangement of the waste and vent lines for each fixture with the sizes of all lines plainly designated. Pipes of the various characters can be indicated by different kinds of broken or dotted lines, with a properly arranged index on the drawing, showing the kind of service each line performs. Where there are groups of fixtures, and where it is desirable to show connections to pumps, house tanks, filters, etc., it is advisable to prepare, on a larger scale than is ordinarily used, a detailed drawing showing the exact arrangement of all piping, together with all fittings, joints, valves, traps, etc., but where the plumbing is ordinary straight and simple work such detailed drawing may be omitted.

The specifications should indicate in the clearest possible manner the quality of the materials to be used and the method of installation. The location, size, depth and general direction of the street sewer, if there be any, should be clearly described, and if there be no street sewer, the final disposition of the sewage should be given in detail.

The location and size of the city water main from which the water supply is to be taken should be plainly stated along with the water pressure at source of supply. This information can be obtained in any well regulated municipality, where it is always kept on file. The specification should list accurately the number of each style of fixtures to be located on each floor of the building and should give such an accurate and detailed description of such fixtures and the trimmings as to leave no doubt as to what is desired.—Contract Record.

Complete Course in Sheet Metal Work

By L. W. KOSER

In Lesson 7 we take up skylight construction.

Generally speaking there are only three different styles of skylights, viz., the single pitch, double pitch and hip skylight. These are often added to by putting on different styles of ventilators. Architects sometimes construct a special skylight for some particular job but in all cases they will be found to be built up from the three styles mentioned above.

The names of the different parts of a skylight correspond to the timbers in a roof only, instead of calling them rafters,

we call them "bars" and instead of calling the lower member a plate we call it a "curb."

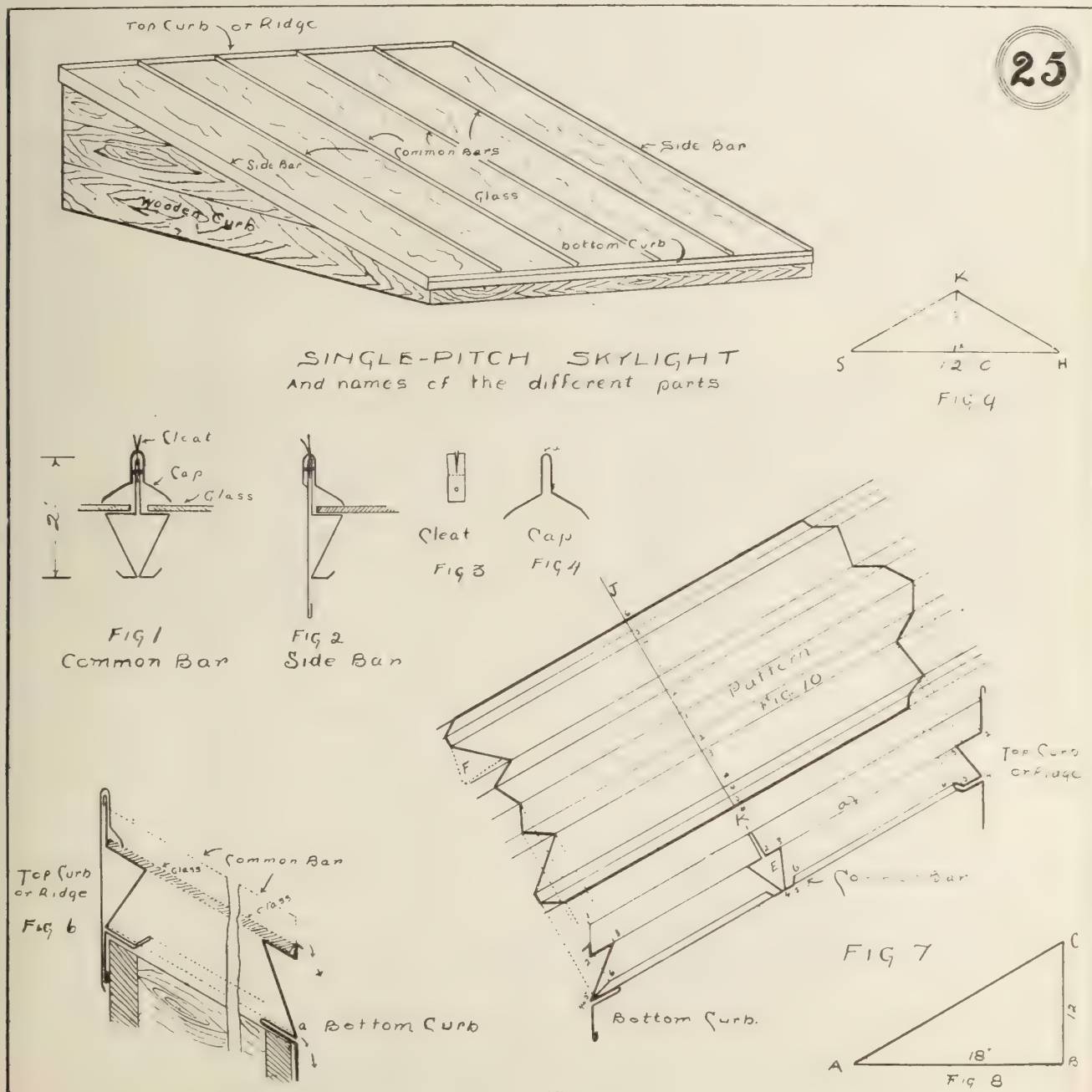
It is well to watch carpenters framing the roofs on buildings and get familiar with the different rafters and their names and uses because metal skylights are simply glass roofs with hollow sheet rafters. The ordinary glass used for glazing skylights is 3-16 of an inch thick and is either rough on one side and smooth on the other, called "rough rolled" or ribbed on one side and smooth on the other, called "ribbed skylight glass." For fireproof construc-

tions it is made $\frac{1}{4}$ inch thick and a wire mesh cast in the centre to keep it together when cracked by heat.

Having now given a general review of skylights we will take up their constructions.

On Plate 25 we illustrate a "single pitch" skylight and give the names of the different bars used on same.

Then we give a large sized detail of these different bars and develop the pattern for the common bar. When this style of a skylight is set on a roof that is flat or nearly so, then it is necessary to give the wood curb a pitch so as to



drain the skylight, but when this style is used on a roof that has a fair pitch then the curb is usually built up 6 in. high all around the opening on the roof.

In the illustration you will notice that the bottom member is called a curb or bottom curb. You will further notice that all the common bars and side bars finish against this curb or "butt mitre" into it.

We give a detail of this at Fig. 5 in which the heavy line is the curb and the dotted lines show the common bar butting into it. It will be noticed that the

bottom of the common bar mitres into the irregular surface of the curb and this mitre is one that is used on every style of skylight.

Referring again to the illustration we notice the top member is called top curb or ridge. We will drop the expression "top curb" and use "ridge" after this. We have only called it top curb as some people use this expression.

Now this ridge, it will be noticed, receives the top end of all the common bars or in other words the common bars butt mitre into the ridge.

leans, San Francisco and Toronto. The purpose of these conventions was directly of an educational nature. One by one the various products of the company were dealt with, care being taken to mark out the various advantages of each and the talking points to be used in making sales. All discussions were conducted by specialists in each line so that the time thus devoted proved of very marked value. Each of these conventions was brought to a fitting close at the end of a week's time by a large banquet.



WORK IS PROGRESSING.

J. T. Blythe, one of the members of the plumbing fraternity in Ottawa, Ont., spent a few days in Toronto last week. Speaking of association work, Mr. Blythe gave very promising reports of the work being done by the Ottawa local society. For some time some difficulty was experienced in getting the different members to work together, but this obstacle has now been overcome and the society is going right ahead.

A jobbing price list is also being prepared by the Ottawa Society and will no doubt be referred to at the Annual Convention of the Ontario Society in March. This list, Mr. Blythe states, will be one of the strongest ties in holding the society together and in tending towards co-operative work on the part of all.



VISITORS IN TORONTO.

Among recent visitors in Toronto connected directly with the Sanitary and Heating Engineers profession are:

C. M. Robertson, President of the Jas. Robertson Co., of Montreal.

Mr. Keefe, manager of St. John, N.B., branch of Jas. Robertson Co.

W. H. Wiggs of the Mechanics Supply Co., Quebec City.

T. R. Stevens, president, and Chester Stevens, manager, of the Empire Mfg. Co., London, Ont.

Jno. McLaren, manager of the Galt Brass Mfg. Co., Galt, Ont.

Harry Agneau, manager of the Crane and Ordway Co., Winnipeg, Man.

Hugh S. Wallace, manager of the Standard Sanitary Co., of Hamilton.

Albert Currie, of Currie and Livock, Ottawa, Ont.

J.P. Band, Sanitary Heating Engineer, Ottawa, Ont.

E. H. Barnes, of H. Barnes & Co., Sault Ste. Marie, was in Toronto last week.

Programme of the Convention

The Ontario Society of Domestic Sanitary and Heating Engineers will hold their Annual Provincial Convention in Victoria Hall, 51 Queen Street E., Toronto, on March 20, 21 and 22, 1913. Provisional programme has already been drawn up and runs as follows:—

THURSDAY, MARCH 20.

10.00 a.m.—Meeting of the Board of Directors and the Executive Committee.

2.00 p.m.—Enrolment.

2.30 p.m.—Opening address by Controller T. Church, vice-chairman of the Board of Control, Toronto. Reception of members.

2.45 p.m.—Roll call.

3.00 p.m.—Appointment of special committees.

3.00-3.30 p.m. — Suggestions from chairmen of committees.

3.30-4.30 p.m.—Resolutions and general business.

4.30-5.30—"Benefits Derived from the Plumbing Regulations." Address by Wm. Meadows, supervising inspector of City Plumbing Department, Toronto.

Meeting open to Questions and discussions by the members.

6.30 p.m.—The members of the society will be the guests of the Toronto Committee to dinner, and an evening of entertainment in Albert William's Assembly Parlors, 179 Yonge Street. This is the regular Irish night of the Toronto Committee. Chairman, P. J. Hayes.

FRIDAY, MARCH 21.

9.00-12.00 a.m.—General business. Report of Board of Directors.

1.30-5.00 p.m.—Reports will be given by the following standing committees:

Sanitary—R. J. Sturgeon, Peterboro, chairman.

Heating—H. G. Waterman, Toronto, chairman.

Arbitration—J. A. Caslake, Collingwood, chairman.

Legislation—H. Mahoney, Guelph, chairman.

Apprenticeship—W. Brittain, Hamilton, chairman.

Educational—J. E. Farrell, North Bay, chairman.

Examination—J. Marshall, Port Arthur, chairman.

Also by the following special committees:

Resolution.

Entertainment.

Nominating.

Chairmen of these to be appointed at convention.

5.00-5.45 p.m.—"Technical Education." Address by E. H. Russell, London.

6.00 p.m.—Dinner and entertainment as guests of the manufacturers and supply houses.

SATURDAY, March 22.

10.00 a.m.—New or unfinished business. Meeting open to manufacturers and supply houses.

The Standard Sanitary Mfg. Co. have extended an invitation to the delegates to visit and inspect new plant at Royce and Lansdowne Avenues, Toronto. Delegates will visit the plant in a body.

The MacLean Publishing Co. will have on display at the Convention a complete set of technical books dealing with all matters which might arise in the sanitary and heating professions.



HOLD MANY ANNUAL CONVENTIONS.

Following a long established custom the 600 or more salesmen as well as the department managers of the H. W. Johns Manville Co., assembled in annual convention on various dates from January 2 to February 8, at Milwaukee, Boston, New York, Philadelphia, Pittsburg, Cleveland, Chicago, St. Louis, New Or-



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The "DART" Union
You Make a Perfectly Tight
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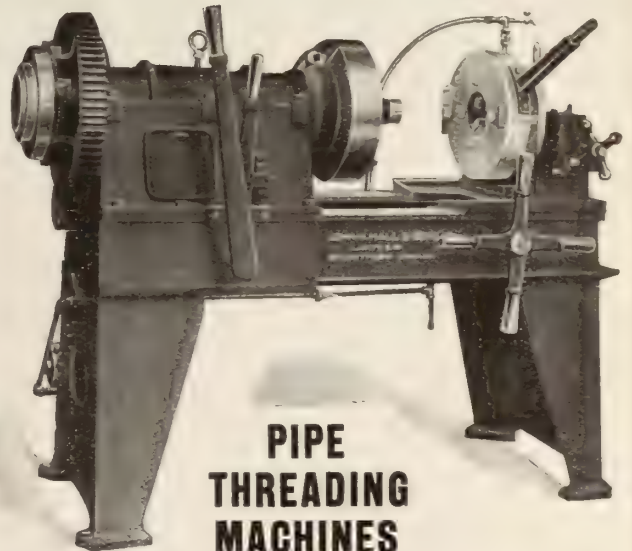
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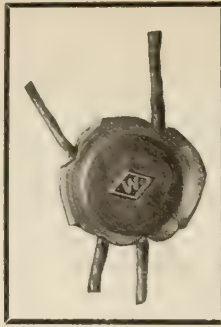
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of the best material and by skilled mechanics, some of them of superior ability, having worked several years on this line in some of the best factories in the United States. Our machines have been in successful operation in all the Pipe Mills, and many of the best Plumbing and Steamfitting businesses in the Dominion for years, and for the above reasons, we believe we can satisfy **YOU**. We are there with the goods. References cheerfully given. Write us for catalogue.

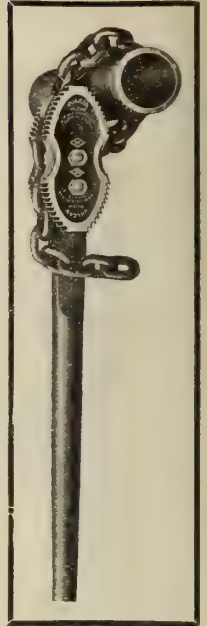
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FOR SALE — FULL SET TINSMITHING tools and machines. For list and price apply to J. H. Rowe, Dunnville, Ont. (6)

FOR SALE — AUTO TRUCK, 40 H.P., capacity 1,500 to 1,800 lbs. Price low. Too small for our needs. Suitable for plumbers' use. Apply National Plumbing Supply Co., Ltd., 115-117-119 Adelaide St., W., Toronto. (5)

FOR SALE—ONE TAYLOR-FORBES CAST iron sectional boiler for low pressure heating, used only a short time. Too small for building. Manufacturers' rating 5,000 square feet. For particulars apply to New Brunswick Telephone Company, Limited, St. John, N.B. (5)

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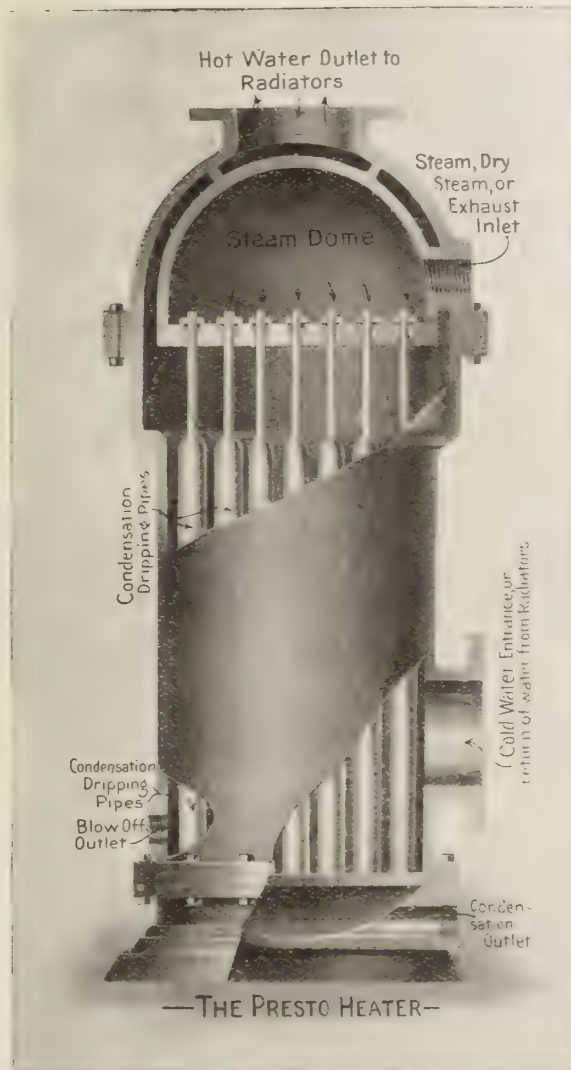
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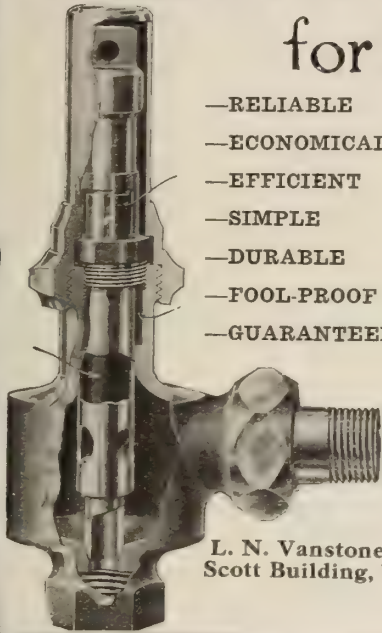
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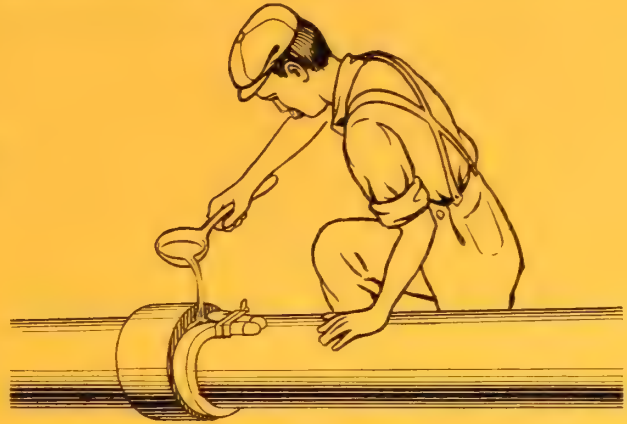
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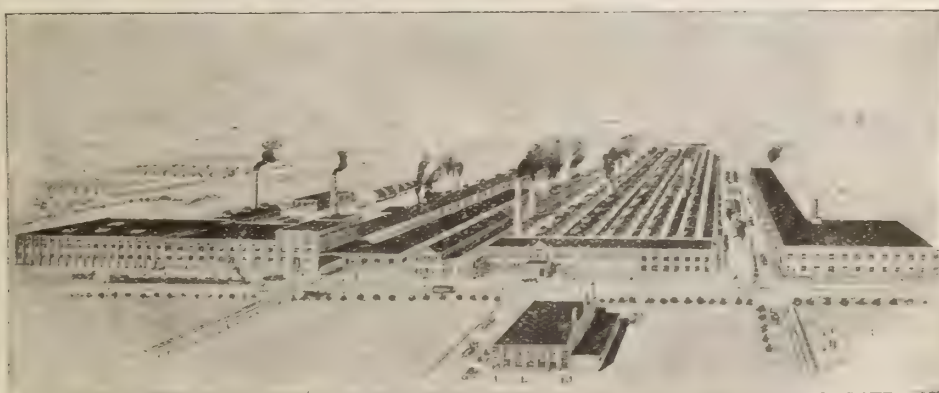
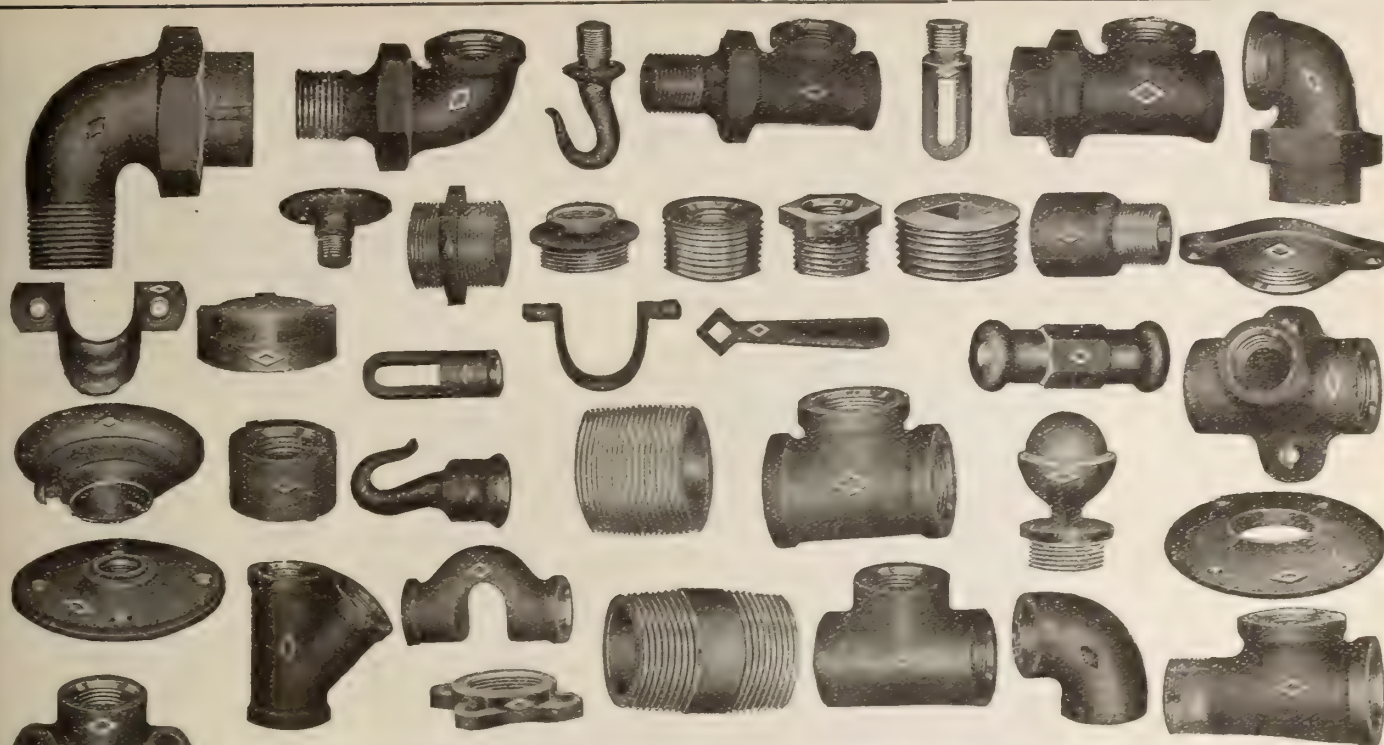
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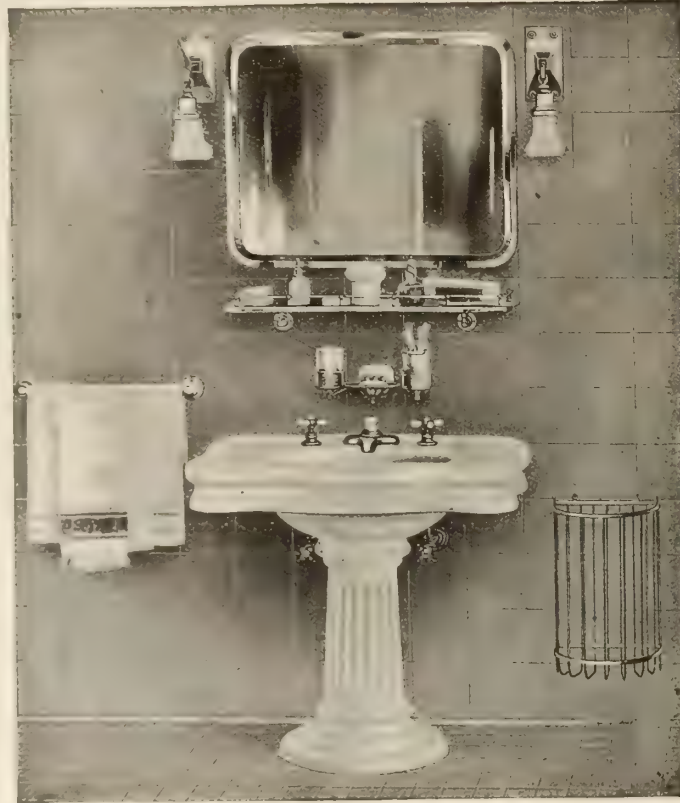


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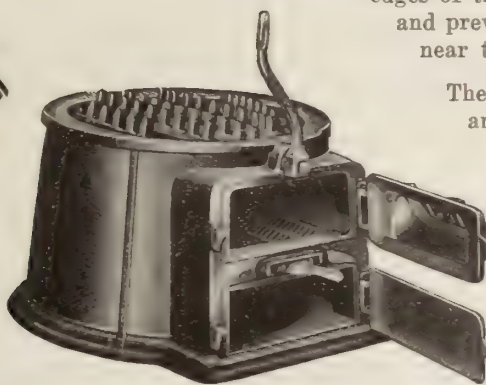
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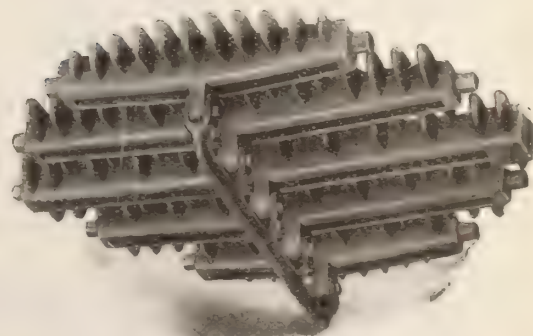
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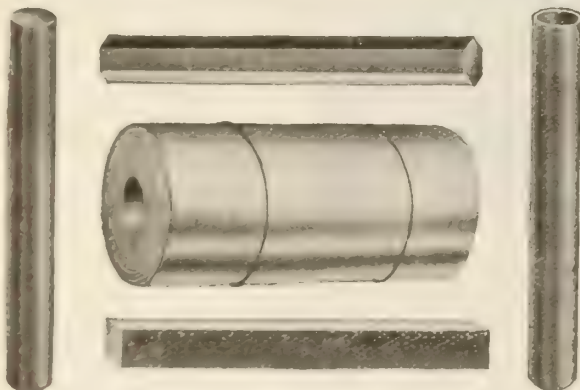
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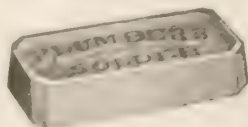
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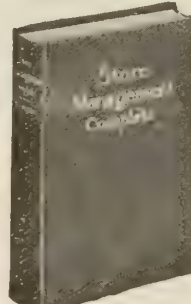
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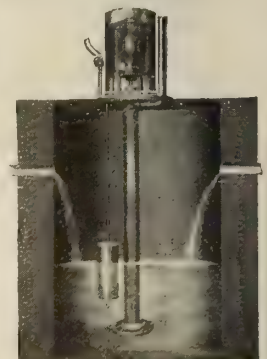
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Gentlemen,—Good circulation in a STEAM HEATING SYSTEM is just as important as good circulation in the human body. When the circulation is bad, tenants get COLD FEET, which is always a bad omen. Chicago Pump Company's Automatic Electric Condensation Pump is the HEART OF THE SYSTEM. It is essential to perfect heating! Perfect heating is essential to paying property!

Never let a man tell you he cannot afford to install our Condensation Pump; the fact is, he cannot afford to be without it. It is far cheaper to pump Condensation water and air out of the system by electricity than it is to carry high steam pressure to force it through the Radiators and return lines. Steam is expensive! Coal and firing—labour are large items!

Our Pump eliminates water hammering in radiators and saves its own cost in one season; if it doesn't we want to know it.

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"ROYAL" Square Steam and Water Boilers
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"KING" Radiators, Water and Steam.

We have a great deal of pleasure in announcing to our friends in the Trade that **our complete line** of Boilers and Radiators for Steam or Water are now ready for delivery.

We have all sizes, from the smallest to the largest, in stock for immediate delivery.

Prompt Shipment Guaranteed

SEE Sectional View of 36"
"ROYAL" Steam Boiler.

Heating Surfaces

NOTE the **Arched Fire Chamber** and greater **over hanging** heating surfaces, than any other cast iron boiler on the market.

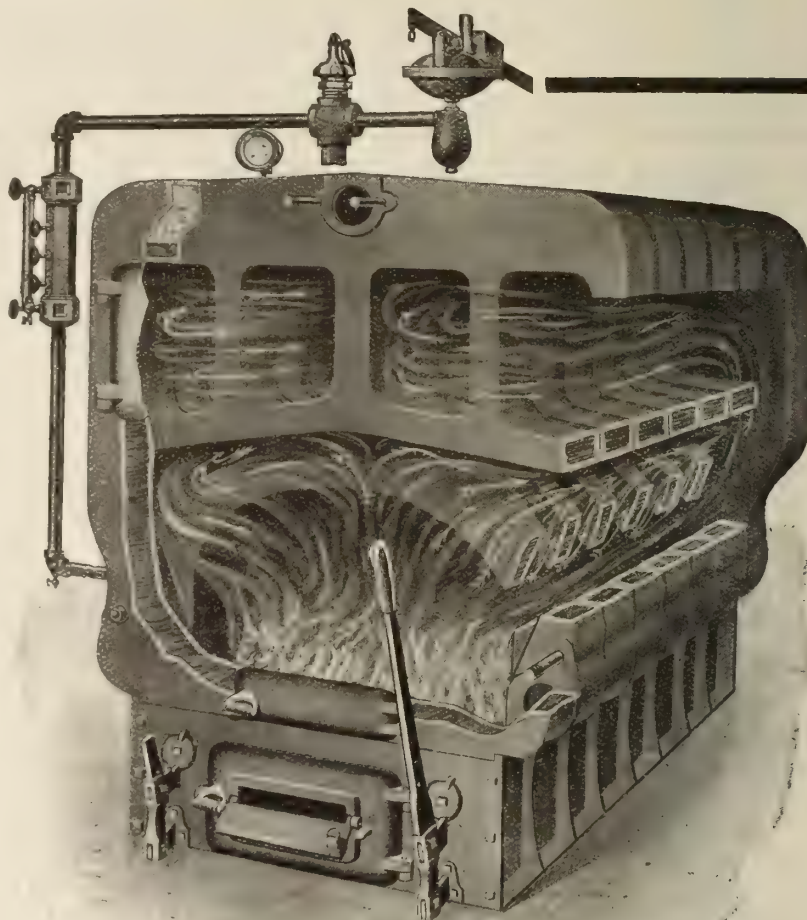
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OBSERVE the **Triple Fire Travel** on **both sides** of boiler, also the **cross fire channels** between each section.

Satisfy your customers. **"ROYAL"** Boilers will satisfy the **most** exacting. **Try one.**

The **"ROYAL"** Boiler carries with it the same unqualified guarantee as the **"King"** Water Boiler.

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MONTREAL
138 Craig St. W.

Record Attendance Expected at Conference

Reports Already Received From Many Members Stating That They Will Be Present—Important Business Ahead—Splendid Entertainment Will Be Provided—Toronto Society's Irish Night a Feature—Everybody Welcome, Whether Member or Not.

Toronto, March 14.—The annual convention of the Ontario Society of Domestic Sanitary and Heating Engineers, as previously announced, will be held in Victoria Hall, 53 Queen Street East, on Thursday, Friday and Saturday of next week—that is, March 20, 21 and 22. Every indication up to the present time is for a record attendance. Corresponding Secretary G. F. Frankland has been continually in touch with local committees in all parts of the province, and states that he has already received word from almost every quarter, not only stating that representatives will be sent, but how many and the names of each. Among the places to be represented are Ottawa, Brockville, Renfrew, Peterboro, Smith's Falls, Hamilton, Dundas, Brantford, London, St. Thomas, Woodstock, Paris, Galt, Preston, Berlin, Waterloo, Guelph, Chatham, Elmira, Wingham, St. Catharines, Fort William, Port Arthur, North Bay, Sault Ste. Marie, Sudbury, Bracebridge, New Liskeard, Barrie and Collingwood. These are a few of the places from which representatives are coming. Word has not yet been received from every committee. London, Brantford, St. Thomas, Brockville, and Toronto will send full representations. Harry Mahoney, of Guelph, will lead his faithful band, composed of Fred Smith, Andy Malcolm, Geo. Greenier, and as many more as he can gather in, to the convention.

J. P. Blythe and J. P. Booth will endeavor to hold up the honor of the Ottawa branch. Ed. Higginbottom is expected from Fort William, and when he comes, Jack Marshall, of Port Arthur, isn't likely to be absent. E. H. Barnes will be down from the "Soo," and J. R. Wainwright from Sudbury. Nothing could keep R. J. Sturgeon, of Peterboro, away, nor J. A. Caslake, of Collingwood. H. A. Bald and Chas. Hoopel, of St. Catharines, will be here to serve as fine subjects for initiation when the St. Catharines Society is brought in. The trio of Hainsworth, Hollinger and Thompson will be here from Berlin, and E. S. Coppins, of Woodstock, sees no reason why he should be absent. These and many more! Altogether it looks as if everybody's coming to make the convention a huge success.

The Business Ahead.

Important business is to be transacted. As already intimated in Plumber

and Steamfitter, the Toronto Society are to present before the convention their retail price list, which has only recently been put into force. Discussion will take place as to whether this list cannot be adopted provincially.

The committee of the seven sanitary engineers appointed to work along with the Government district medical health officers will be here in full force to present a report on conditions as they find them, giving suggestions thought necessary.

H. G. Waterman, of Toronto, chairman of the heating committee, will bring before the society a new form of heating specification.

J. Marshall, of Port Arthur, in his report will show what progress has been made along the line of examinations to the Plumbing and Heating professions.

W. Brittain, of Hamilton, promises a lively report, and will present a new apprenticeship indenture form for the approval of the society.

These and various other questions will be the topics of discussion.

Entertainment Provided.

Members are particularly requested to be present at the opening session, Thursday afternoon, when enrollment will be made, committees appointed, and much important business transacted, which no one can afford to miss. Under no condition should anyone be absent from the evening entertainment provided by the Toronto Society on Thursday in the form of Irish night. The evening's programme will be typically Irish throughout. Patrick J. Hayes, Dan Glynn and J. E. Fullerton make up the committee in charge, and, judging from the efforts of these gentlemen in the past, there is every indication of a thoroughly enjoyable programme being presented.

The Standard Sanitary Manufacturing Co. have very kindly extended a hearty invitation to all the members of the society to visit their new plant at Lansdowne and Royce Avenues, Toronto, and inspect the making of all enamelware from start to finish. Special cars have been arranged to convey the members to the works on Saturday morning at the close of business discussion. The trip to the plant will be by invitation only, and all members should make it a point to see G. F. Frankland at Victoria Hall, where the convention is to be held, and secure such invitations.

The MacLean Publishing Co., publishers of Plumber and Steamfitter, are having on display at the convention a full line of the best technical books dealing with the Plumbing and Heating professions. J. I. Coddington will be in charge of the display, and will be pleased to discuss the books with everyone. Journeymen especially are invited to take advantage of this opportunity and look up the best authorities on the trade.

Everybody Welcome.

The convention will be open to everyone interested in the trade, whether he be a member of the society or not. "If you are not a member come and see what is being done, and if you are favorably impressed with the management, opportunity will be given you to join at this convention. This is the attitude of every member of the committee.

Rules to be Observed.

A few rules will need to be strictly observed in connection with the procedure on the three big days next week:

1. Be sure that you see A. F. Passmore, and that he gets you to sign the roll, so that you will be admissible to all that is going on.

2. Lay for E. T. Needham for a souvenir badge of the convention.

3. Don't fail to be present at Albert Williams' Assembly Parlors on Thursday night, and see what the Irishmen can do in the way of entertainment.

4. The display of Technical Books is for your benefit; make use of your opportunity.

5. Do all you can to make the convention the most successful in the history of the society.

PROGRAMME.

Thursday, March 20th, 1913—First Day.
Morning Session.

10.00 am.—Meeting of the Board of Directors and the Executive Committee.

Afternoon Session.

2.00 p.m.—Enrollment.

2.30 p.m.—Opening address by Controller T. Church, vice-chairman of the Board of Control, Toronto. Reception of members.

2.45 p.m.—Roll call.

3.00 p.m.—Appointment of special committees.

3.15 p.m.—Suggestions from chairmen of committees.

3.30 p.m.—Resolutions and general discussion.

4.30 p.m.—Address by Wm. Meadows, supervising inspector of City Plumbing Department, Toronto, on "Benefits Derived From Plumbing Regulations." Open to questions and discussions by the members.

6.30 p.m.—The members of the society will be the guests of the Toronto committee to dinner and evening of entertainment at their annual "Irish Night," at Albert Williams' Assembly Parlors, 179 Yonge Street. Patrick J. Hayes, chairman; associates, Dan Glynn, J. E. Fullerton.

Good Friday, March 21st, 1913.
Morning Session.

9.00 a.m.—General business and report of the Board of Directors.

Afternoon Session.

1.30 p.m.—Reports will be received from the following standing committees:—

Sanitary—R. J. Sturgeon, Peterboro.

Heating—H. G. Waterman, Toronto.

Arbitration—J. A. Caslake, Collingwood.

Legislation—H. Mahoney, Guelph.

Apprenticeship—W. Brittain, Hamilton.

Educational—J. E. Farrell, North Bay.

Examination—J. Marshall, Port Arthur.

Also the following special committees:

Resolution.

Entertainment.

Nominating.

5.00 p.m.—Address by E. H. Russell, London, on "Technical Education as Pertaining to Plumbing and Heating."

Saturday, March 22nd, 1913.

Morning Session.

9.00 a.m.—New or unfinished business.

At the conclusion of business the members will visit in a body the Standard Sanitary Manufacturing Co.'s new plant at Lansdowne and Royce Avenues.

RECEPTION COMMITTEE.

The members of the reception committee to be on hand at the convention are: T. B. Smyth, chairman; J. E. Fullerton, secretary; E. T. Needham, A. F. Passmore, H. Hillier, F. Gentle, G. Kirtley, H. Ruddick, T. Price.

OPENING UP CANADIAN FACTORY.

The Rund Manufacturing Co., of Pitsburg, Pa., manufacturers of instantaneous hot water heaters, are opening a Canadian branch factory on Adelaide St. W., Toronto, Ont. First efforts will be devoted mainly to the manufacture of tank heaters, but the company will gradually work into the manufacturing of steam radiators, etc. Their

new factory comprises 9,000 square feet of manufacturing area. All orders from Canadian firms will hereafter be filled direct from Canadian branch.

Market Report

TORONTO.

Toronto, March 14.—Plumbing markets are altogether without feature so far as price changes are concerned. Business is beginning to pick up with signs of spring work soon commencing, and in some lines jobbers are being pressed for shipments more than ever.

There is still considerable talk about the tightness of the money market. That money is tight, there is little doubt, but conditions are inclined to be slightly exaggerated. All spare cash being tied up in real estate and investments of one kind or another has tended to make collections poorer, but this is experienced more especially in the larger centres. The banks, scenting trouble, raised the cry of tightness of money early and called in their loans so that in this way a fair warning was given. Collections now are reported as pretty well up to average of other years.

Enamelware.—Prices on all lines of enamelware remain firm with little sign of any immediate change. Orders are now being booked for spring delivery and with increasing demand goods are beginning to move freely. Porcelain and vitreous china are also in steadily increasing demand, and good orders are now being received.

Iron Pipe and Fittings.—Stocks have now increased to such an extent in iron pipe that as one jobber put it "We have so much we can scarcely find room to store it." Evidently there will be no difficulty in making prompt shipments when desired. Fittings too are now to be had in larger quantities. Prices continue unchanged at: 1 inch galvanized pipe, \$6.19; 1 inch black pipe, \$4.54; cast-iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast-iron bushings, 65 per cent. off; malleable iron bushings 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—Situation in soil pipe with some jobbers looks a little brighter; others, however, are still booked for all visible supply for the next three months. Prices are: Medium and heavy, 60 and 5 per cent.; 7 and 7 inch sizes, 45 per cent.

Lead Pipe.—Not even has there been any change recently in prices of lead pipe. The market in this line now appears to have taken on a much steadier

tone with no change expected. Quotations are: Lead pipe, 15 per cent. off; lead waste, small lots, 6c per lb.; quantities, 5½c.

Solder.—This has been a poor winter for the sale of solder so far as extra demand caused by bursting pipes is concerned. Demand now is only fair with unchanged prices at: Easy wiping, 26, half and half, 30.

Boilers and Radiators.—Standard sizes in radiators can now be secured with little difficulty. Lower sizes, however, are scarce to such an extent that some styles can scarcely be obtained. Stocks in boilers are steadily on the increase, good supplies being carried in all lines.

Metals.—The metal markets have shown a distinct tendency towards greater strength during the past two weeks. A few declines are noted this week but the general situation warrants every confidence for the future. Iron and steel products remain scarce and firm; tin has declined 1c per lb., but is reacting; lead is down 10 cents per 100 lbs., and demand on the increase. Copper continues quiet and unchanged since the decline of ½ cent a week ago. Sheet copper tinned on one side has declined 1 cent per lb., and is now quoted at 26c for 16 oz. or 27c for 14 oz. Pig iron is unchanged.

HYDRAULIC RAMS.

Editor, Plumber and Steamfitter.—Please give me some information in regard to a hydraulic ram.

I.M.

This invention can be used for the purpose of pumping water into various kinds of tanks. It is run by water either the same as the water delivered or perhaps from some other source. Authorities state that the ram will work if the water has a fall of some five feet in 100. The drive pipe to the ram should be about 40 feet long. It has been found that it is not a good plan to make sharp turns in the pipe lines. Bends are advised as a better practice. In cold climates the pipe lines and ram will have to be protected from freezing.

D. C. H.

SHOULD A MAIN SEWER BE VENTED.

Editor, Plumber and Steamfitter.—Is it thought to be the proper thing to vent the main sewer at certain points? In one case not long ago in a connection that I had to make to an unvented sewer the amount of foul air that came forth was something terrible. Please inform in your next issue.

Plumber.

Tips for Helpers---By "Phoenix"

COLLEGE GRADUATES, GENERAL AND PRACTICAL.

The average journeyman and the average college graduate mix similarly to oil and water. Neither one has much use for the other. A great mistake on the part of the human constituents for, in this case, each has something that the other lacks.

At the present time, all over the United States there is a great discussion going on with regard to certain educational matters, the backbone of the whole hinging on vocational training. The practical schools, where men and boys are taught many different trades and occupations have come in for a share of somewhat unjust criticism at the hands of people who might be employed

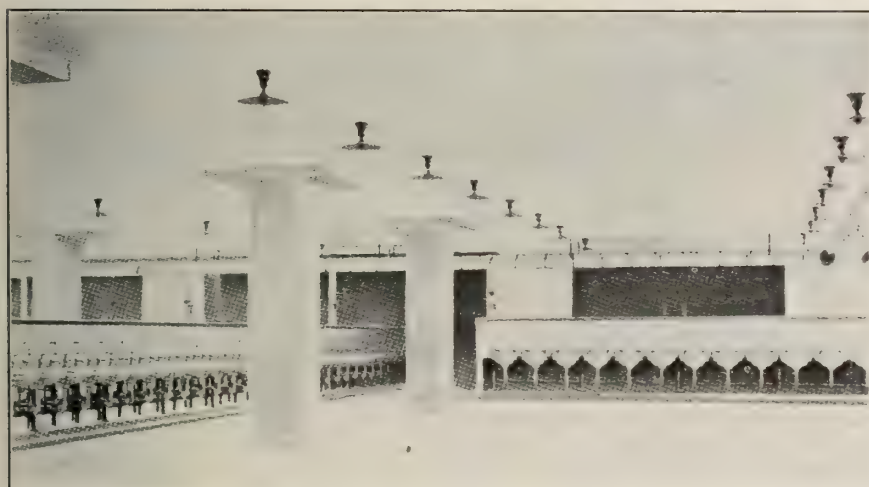
is unfair, not only to the graduate, but also to the employer himself. He should have more horse sense. The college man, in most cases, probably has the theory of matters at his fingers' end. He finds out, however, when he gets into the every-day mix up that theory and practice are two very different matters. On the other side, the journeyman is long on the practical and generally mighty short on theory. In nine cases out of ten he will, however, make a better showing—for a time—when advanced than the college man when he first takes hold. The other journeymen will help out one of their own rank whereas in the case of the school-taught man they generally contrive to hand him something sooner or later.

An education that is fitted to meet the

or business man lays in his ability to handle men. To some people this comes perfectly natural, others learn by practice; some never get the habit. This teaching of management is rarely taught in schools—the only exception being Normal schools where the pupils are prepared for teachers. Many cases have been noted where managers, foremen, etc., who could boss men, have spent many midnight hours in acquiring the theory of their trade or calling. Why would it not be a good proposition to reverse this proceeding and have the student classes given practical lessons and experience in the management of employees? If it works out all to the good from the bottom up, why will it not work with the reverse English?

Thus it would have to be essentially practical and that is what seems to be most lacking in most of the schemes for education. They are "schemes" only, rather than true schools. Practical ability and education must be united to produce the best results. Take the example of a most excellent factory wash room given in the illustration.

Does it not show forth a combination of the practical ability on the part of the journeyman with the education received through experience and study on the part of the manufacturer of the fixtures and also an ability of selection on the part of the factory management, which could come, only with experience and a judgment of men and conditions?



An illustration of what education, practical ability and experience have produced in the way of a sanitary wash room for employees.

in a better line of endeavor. The technical schools are fully equipped to train men in various trades and branches of engineering, etc, but they are not (nor is it expected, generally) equipped to train their pupils in the management of men and business.

The pupil or the employer who expects, as the result of a course in a technical school, a fully developed business man, or an experienced journeyman or engineer is going to be sadly disappointed in this respect; and some time will elapse before the pupil becomes thoroughly way-wise. An employer who hires a college graduate (either practical or otherwise) direct from the college and at once places the graduate in some position of great authority will meet with great disaster. Such a proceeding

needs of one's life certainly pays. This has been demonstrated beyond question. The points upon which the matter hinges are, what kind of an education shall this be and how administered?

Chicago is preparing to spend somewhere between \$12,000,000 and \$14,000,000 in the next school year to teach the young idea how to shoot. According to the news printed in the daily papers this comes nearer the positive truth than is comfortable, for never, in the history of the city, has there been such a carnival of crime in that city as in the past year. There is certainly something lacking from a form of education that does not produce better citizen results.

Returning to the main points mentioned it can be said that a great deal of the successful part of a successful manager

EMPIRE BRASS WON OUT.

London, Ont.—The Empire Brass hockey team recently defeated Perrin's team, thereby winning the championship of the manufacturer's league and securing the Brenner Cup. The first part of the game was pretty much an even struggle and when the referee's whistle blew for half time, the score was 1 to 1. It was in the second half that the Empire Brass seven got right down to business, resulting in the scoring of four more goals, so that at full time the score stood at 5 to 1. In the second half both teams displayed their powers to better advantage than during the earlier part of the game, but much of the play favored the Brass Works team. After the game Ald. S. F. Glass, made a short speech to the boys, complimenting them on the sportsmanlike manner in which the game was played.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada \$1.00 per year.
United States, \$1.50. Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto Atsbec, London, Eng.

JOHN BAYNE MACLEAN, - President
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Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, MARCH 15, 1913

ATTEND CONVENTION.

That the Annual Convention of the Ontario Society of Domestic Sanitary and Heating Engineers to be held in Toronto on arch 20, 21 and 22 will be one of great importance in the history of the society is quite apparent. Questions of both local and provincial interest are to be discussed, and the decisions reached will undoubtedly mean much for every sanitary and heating engineer throughout the province. A new retail price list compiled and used by the Toronto Committee will be presented before the society for discussion and provincial adoption. Reports will be had from all standing committees which will cause discussion of many matters of vital interest. The master plumbers who have been acting as district health officials will present their report on sanitation throughout the province. Such discussions as these, and many others, will fill up the hours of the convention. Can you afford to miss hearing questions of vital importance in your profession discussed by men who have made a thorough study of their subjects?

In previous years only one day has been devoted to the convention, so that there has been one continual rush to get through in any shape. This year, however, with the three days, the same pressure for time will not be felt, so that not only can discussions be entered into more freely, but time will be allowed for social enjoyment as well.

From reports published elsewhere in this issue it becomes quite apparent that every effort is being expended to make the convention a red letter one in every respect. All arrangements are now finally made and now it only remains for every sanitary and heating engineer to turn out and take advantage of the convention which should be to every one most valuable.

NEED FOR LEGISLATION.

The Plumbers' Trade Journal remarks, editorially: As we have before discussed, we are living in an era of legislation, much of which is undoubtedly just and wise, considerable of which is likely foreign to public interest. During the present and coming sessions of State Legislatures and the Congress of the United States, there are appearing and will no doubt continue to appear, many measures which may, directly or indirectly, affect the interests of the plumbing industry, particularly the master plumbers. Fortunately, the various associations of the

trade have their legislative committees, whose watchful eyes are ever on the lookout for the appearance of new legislation, so that the individual rights of the members may be conserved at all times and under all reasonable circumstances. The great good accomplished by these committees during the past years is a matter of just pride and congratulation; but the demands of the future will far outweigh in importance any of those of the past. Every year there seems to be an increasing amount of legislation, and it behooves the trade to increase its alertness twofold, if possible. Every member owes it to himself and his association to volunteer to serve in the army of defense.

SETTLE IT AT ONCE.

In the last issue of Plumber and Steamfitter, the drain question in Toronto was dealt with at some length. It was pointed out that the new by-law was to come before the council for final reading on March 10. The council met on March 10, as arranged; heard what was to be said, and simply postponed all discussion until Tuesday, March 18, the date when revision of the new building by-law is to be discussed. The council deemed it appropriate that the two questions should come up together as they are closely akin to one another. Both tile men and sanitary engineers have been asked to send deputations to the next meeting to plead the cause of each. This looks very much like repetition to kill time, as the case has already been presented by both sides in a most thorough manner.

HEALTH LEGISLATION.

A contemporary, The Plumbers' Trade Journal, speaks on the question of master plumbers as health officers thus: We are pleased to note that master plumbers are being boomed everywhere for membership in local and state health boards. This is a most favorable sign of the times. Every health board would be the more serviceable that could boast of the membership of one or more master plumbers. There is every good reason why the example set by some of the associations should be more generally adopted, especially where there appear to be fertile opportunities. The associations have already accomplished much, in matters of a legislative nature, which is greatly to their credit, but there are work and further opportunities just ahead.

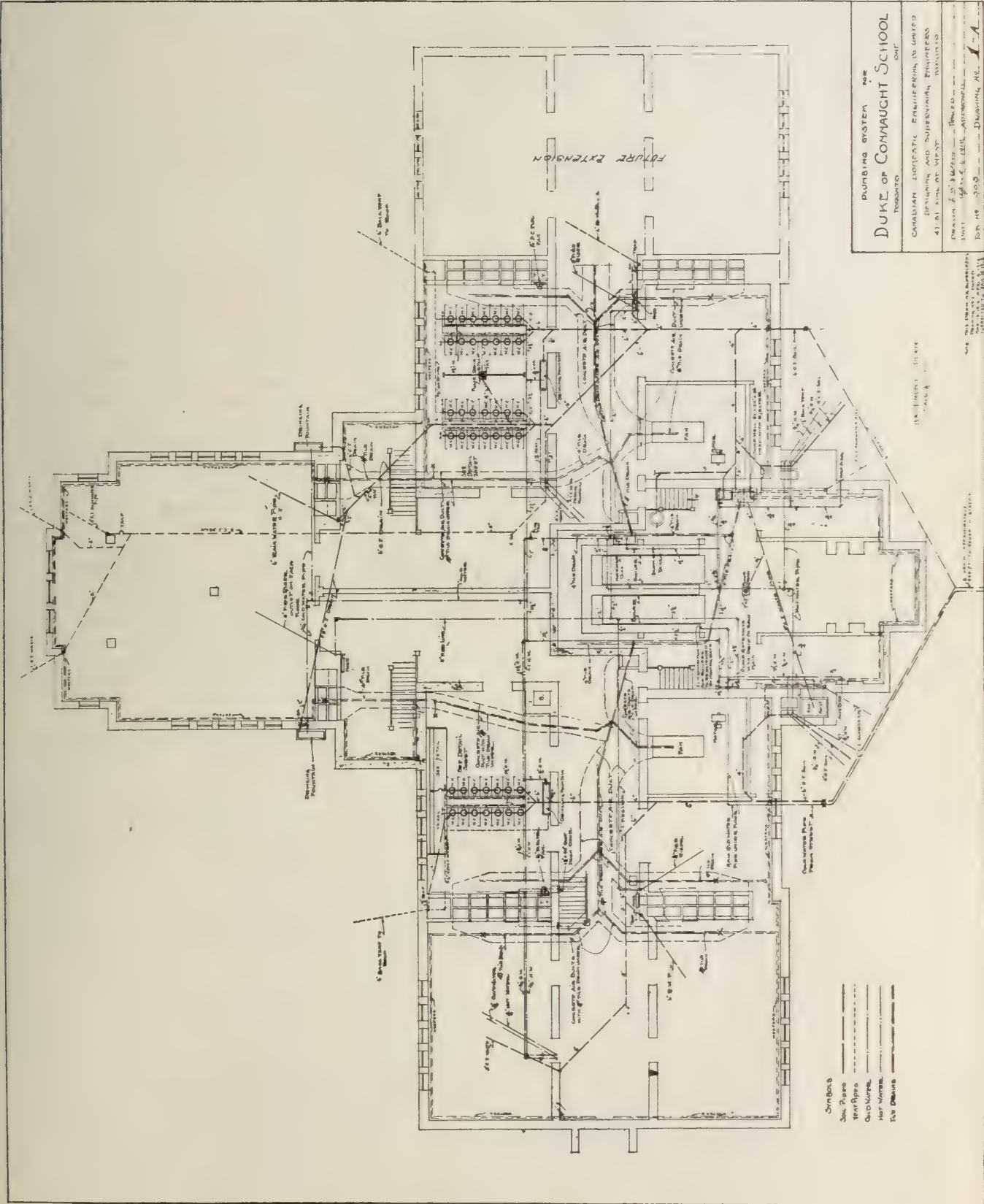
Plumbing Installation in the Toronto School

Description of Plumbing System At Present Being Installed in the Duke of Connaught School, Toronto, Ont.—Sump in Boiler Room—Water Discharged by Automatic Ejector—Description of Plumbing Fixtures Employed.

In the last issue of Plumber and Steamfitter were described the heating and ventilating systems, vacuum cleaning and electric wiring in the Duke of

Connaught School, on Morley Avenue, Toronto. In this issue the plumbing system, which is being installed by Purdy, Mansell, Ltd., of Toronto, will

be dealt with. Designing and supervising engineers are the Canadian Domestic Engineering Co., of Montreal and Toronto.



Plumbing.

All soil pipe is of extra heavy weight, with a 10-inch extra heavy cast iron drain carried to the city connection on the street. All vertical stocks and downpipes are equipped at the base with clean-out screws. Thus in case of clogage of any kind ready admission is immediately insured. The traps of all fixtures are back vented (in accordance with city by-law regulation) through standard weight cast or wrought iron vent pipes of the same size as the waste or vent pipes provided for such fixtures. Also all vent connections are made with Y branches.

The building is supplied with a 3-inch cold water main, which is divided inside the building into three main lines—namely, a 2½-inch line to the fire risers, a 2-inch line supplying feed for the heating boilers, and a 2½-inch domestic line supplying cold water to all the plumbing fixtures. Each branch from the main and the supply pipes is equipped with a controlling valve at all fixtures.

All the slop sinks and basins are supplied with hot water generated by means of a low pressure steam copper coil instantaneous water heater. A circulating pipe is run from the head of all hot water risers, and from any isolated branch running a distance of 8 feet from the riser. This return circulation is carried to the return openings of the water heater, and is sufficiently large to give hot water almost immediately upon the faucet being opened.

The building is protected from fire by means of three 2-inch stand pipes equipped on each floor and basement with 50 feet of 1½-inch rubber hose, complete with nozzle racks and valves.

For the purpose of removing ashes from the boiler a plunger ash hoist, with a lifting capacity of 800 lbs., is installed and works altogether by hydraulic pressure.

All water piping of every description in the basement, with the exception of the fire lines, is to be covered with a 1-inch thickness of wool felt, with a canvas jacket.

As a great deal of the heating or ventilating ducts is carried under the floor below the level of the main drain, a line of weeping tile is carried through the ducts at different parts of the building leading to a sump installed in the boiler room.

The dimensions of the sump are 36 inches x 24 inches x 36 inches. Material used is concrete both for sides and bottom, the top being covered with a ¾-inch steel plate covering. The surplus water gathered in the sump is discharged to the level of the drain by

means of an automatic ejector with a ball float and capable of handling 400 gallons of water per hour at a lift of 8 feet under a pressure of 60 lbs. The drainer is set on a concrete base 6 inches above the bottom of the sump well so as to be entirely free from getting sediment into the valves.

Description of Fixtures.

For the use of the engineer there will be installed in the boiler room a 20 x 36-inch cast iron enamelled roll rim sink with integral back and supplied with hot and cold water. On each floor will be placed a 22 x 20-inch enamel iron roll rim slop sink, also supplied with hot and cold water. The teachers' recreation rooms and the kindergarten are furnished with enamel iron lavatories, with nickel-plated brass finish on supply pipes, traps and faucets. These also are supplied with hot and cold water.

In each toilet room, in the basement and in the play yards outside of the building, there are to be installed enamelled iron drinking fountains, each equipped with six self-closing bubbling nozzles in place of the usual nickel-plated finished nozzle. During the winter season the outside fountains are to be protected by means of a heavy sheet iron coating.

In the boys' toilet room, in the basement, there will be installed a urinal 24 feet long, the urinal to be composed entirely of slate and flushed by means of a hand operated ¾-inch pipe carried along on the face of the back of the urinal with perforations ¾-inch in size at 1½-inch centres.

The water closets in the boys' and girls' toilets in the basement are of special child's type, with the top of the bowl 14 inches from the floor. All are syphon jet closets, and are equipped with seat action automatic flush valve of the type designated as "Board of Education Valve."

The stalls enclosing these closets are constructed of 1-inch slate, the divisions being carried to a height of 4 feet at the back and bevelled or sloped to a height of 3 feet at the front.

The closets are set back to back, and between the backs of each range is a 24-inch space, in which is enclosed all vent piping and water piping to the flush valves. Access in case of repairs is made through slate doors at the ends of each range.

A 4 x 18 register face is placed near the floor midway between every alternate division, thus giving an opening of 9 x 4 to each closet. A 20 x 15-inch opening is made in the top of the space between the closets, and the circulation is made by means of an induced draft through this 20 x 15 opening in the exhaust flue in the heating contract.

The teachers' toilet rooms are fitted each with a syphon jet closet, with an oak tank.

All work done is under the city inspection and according to municipal ordinances. Specifications, as in all Toronto jobs, call for both water and smoke tests, the water test being made at the completion of the laying of all pipe lines, and the smoke test after all fixtures are connected up.



PARTNERSHIP DISSOLVED.

Rainy River, Ont.—Robt. J. Russell and Samuel Sage, sanitary and heating engineers, have dissolved partnership.

Standardization of Ordinances

In a recent issue of Plumber and Steamfitter an article appeared on the movement to standardize plumbing ordinances. The movement, it was explained, had its origin in Calgary, Alta., and from there, by means of plumbing inspectors and associations, it spread throughout all the Western provinces. The idea met with great favor everywhere, so that the movement spread very rapidly.

Now comes the announcement that a convention of the plumbing inspectors and sanitary engineers throughout Western Canada is to be held in the Industrial Bureau Building, Winnipeg, Man., on April 16, 17 and 18 next.

The meeting is the direct outcome of the movement originated in Calgary, and, therefore, the most important business will be the consideration and

adoption of a uniform plumbing code. The first business, however, will be the formation of a society or association along the lines of the American Society of Plumbing Inspectors and Sanitary Engineers.

The standardizing of ordinances in all the prairie provinces is a big undertaking, and one in which every sanitary engineer should take special personal interest. A record attendance is, therefore, requested so that full justice may be done this important question. Any person located in any part of the Dominion and interested in sanitary engineering will be made welcome at this convention. Notification as to their intention to be present should be given to Jas. Smith, plumbing inspector, Office of the City Engineer, 223 James Street, Winnipeg, Man.

Plumbing System in New American Hospital

Most Modern Methods Adopted Throughout Building—Cost Will be About \$375,000—Special Care Taken in Installing and Protecting Pipe Lines.

WORK has recently been started on what is to become one of the finest of Brooklyn hospitals, says "Domestic Engineering," and which before completion, will cost about \$375,000. The hospital is known as the Greenpoint Hospital and is located on Bullion Street between Kingsland Avenue and Debevoise Avenue. The erection of the building is being made by the department of Public Charities, of which the Hon. Michael Drummond is commissioner in accordance with the plans and specifications prepared by Frank J. Helmle, architect, of Brooklyn, the engineer for the work being Frank Sutton, of New York City.

Plumbing Work.

The plumbing work on this hospital, which will cost about \$39,000, is being performed by James Harley & Co., of Brooklyn, N.Y.

Drainage System.

The house sewers and underground plumbing pipes are of extra heavy cast

The traps for the house sewers are of extra heavy cast iron, with two cleanouts closed with brass cleaning screws. The main traps have a fresh air inlet connected on the house side, and all the leaders are trapped before being connected to the house drain. The wash basins have 1½-in. traps, the slop sinks 3-in. iron traps in general, ordinary sinks 2-in. brass traps, and urinals 2-in. traps cast in the bowl, while water closets are trapped in the bowls with earthenware traps. Cleanouts are provided on the drainage system with brass screw caps set in graphite and oil, and all water closets and slop sinks with

Fixtures.

The plumbing fixtures to be installed in this hospital are briefly outlined below:

The water closets are deep seal syphon jet, with non-soiling flushing rim and concealed jet, and with the sanitary perfect screw connection; polished birch stained mahogany seat, with nickel-plated hinges, nickel-plated brass flush valve, with integral stop valve; nickel-plated brass connections to wall.

There are also some water closets same as above described, but without the raised porcelain front and fitted with white non-split seat and cover.

There are also some syphon wash-down water closets with integral porcelain seat and the sanitary perfect screw connection, birch stained mahogany seat; nickel-plated brass push button flush valve, with integral stop valve and connections to wall, with escutcheons.

The urinals are vitreous porcelain lipped with brass trap for 2-in. iron

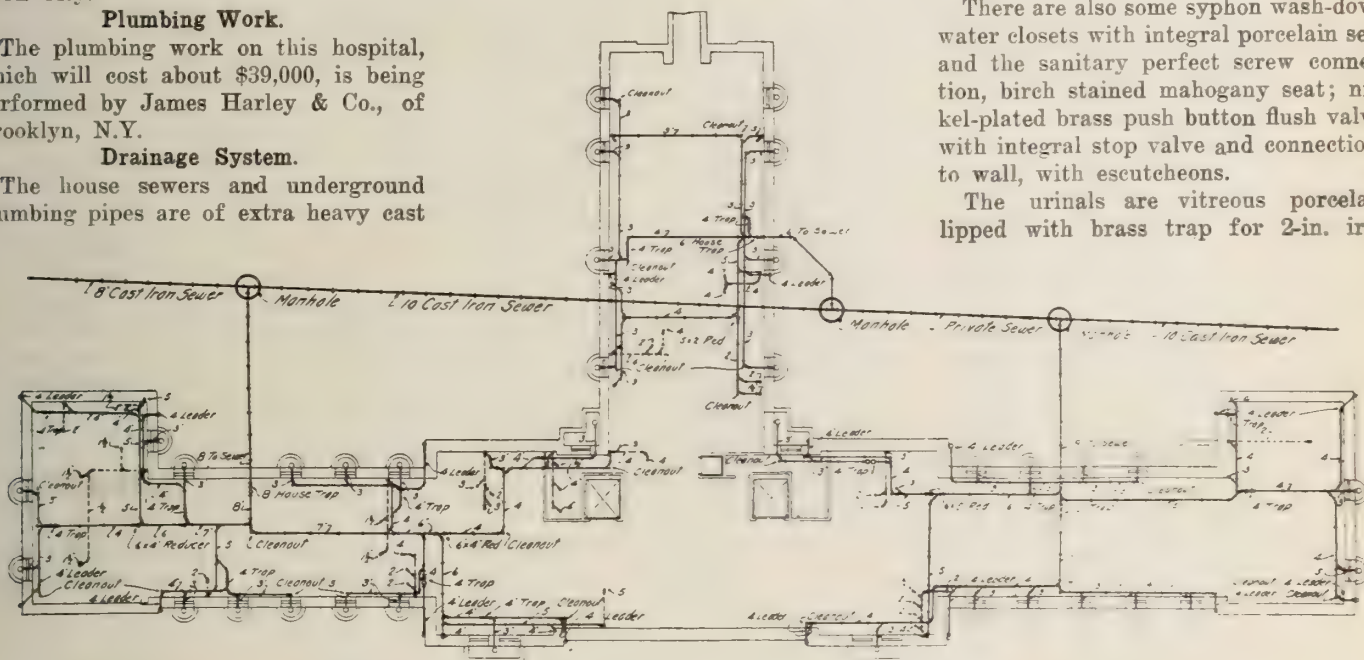


Fig. 1.—Basement Plans of Drainage and Private Sewer.

iron and likewise all fresh air pipes. A complete layout of the basement drainage lines is shown in Fig. 1. The vertical lines of the entire soil, waste and vent system except where connections are made to fixtures is of galvanized wrought iron supplied with Y and T's recessed drainage fittings at points required, and an elevation of a few typical risers is shown in Fig. 2.

The outside leaders are connected to the drain with cast iron pipe, commencing 5 ft. above the grade, while all inside leaders are of galvanized wrought iron. The branch waste and vent pipes are of heavy galvanized iron with recessed fittings, no lead being used except for water closet bends and vent connections. All the exposed piping at or near the fixtures is in general of nickel-plated brass.

earthen trap standards are set in heavy brass screw floor flanges.

The inside floor cesspools, excepting those in the toilet rooms and a few other cases, are of a spherical shape with a 3-in. outlet and a locked strainer supplied with hot and cold water.

The toilet room partitions for the urinals, showers, water closets and other fixtures, and also the marble work for the sinks, are constructed of first quality gray Tennessee marble of 1-in. thickness and of a single piece. All fronts are 2 in. thick and are set into the floor, while the partitions start 6 in. above the floor level and have an average height of 6 ft. 6 in., with caps 2 in. high and 3 in. wide. A layout of a typical toilet room and its soil, waste and vent piping, is given in Fig. 3.

pipe and vitreous porcelain trap shield, fitted with nickel-plated inlet coupling; nickel-plated push button push valve, with nickel-plated stop valve, lock shield and stem for detachable key; not local vented.

The baths are porcelain, 5 ft. 4 in. long, with glazed exterior; nickel-plated high bell nozzle combination supply and waste fittings, with nickel-plated sprinkler and rubber tube.

There are also some enameled iron rim baths 5 ft. 6 in. long, with exterior finished white; nickel-plated brass high bell nozzle combination supply and waste, with china name plates marked "Hot" and "Cold" and with nickel-plated supply pipes to floor, with unions.

The lavatories are extra heavy vitreous porcelain 24 x 19 in. with integral back and wall support and with china

caps for the bolts at back; nickel-plated brass waste plug and coupling and nickel-plated waste; nickel-plated slow self-closing push bottom faucets, with china name plates marked "Hot" and "Cold" nickel-plated brass adjustable trap to wall for 1½ in. iron pipe.

There are also some extra heavy vitreous porcelain lavatories, with integral backs, ground to set against wall and with concealed supporting brackets, size 27 x 24 in. with nickel plated goose-neck nozzle with rose spray; nickel-plated clover knee action supply valves; with stirrup angle, nickel-plated supply pipes to wall, with stop valves; nickel-plated clover knee action iron pipe.

There are also some extra heavy vitreous porcelain lavatories 27 x 22 in. with vitreous porcelain pedestal nickel-plate combination supply and waste, with china name plates marked "Hot" and "Cold," nickel-plated adjustable trap to wall for 1½ in. iron pipe; nickel-plated supply pipes to wall with angle stop valve, with nickel-plated lock shields.

The double lavatories are 54 in. long and 25 in. wide by 14 in. deep, of porcelain, with two bowls and with porcelain legs; two nickel-plated goose-neck nozzles, with rose sprays; two nickel-plated clover knee action valves and stirrup handle and with nickel-plated supply pipes to wall, with stop valves with lock shields and nickel-plated supply pipe from valve to nozzle and nickel-plated clover knee action waste; two nickel-plated brass adjustable traps to wall for 1½ in. iron pipe.

The sinks are porcelain roll rim 36 x 23 x 7 in. deep, with porcelain legs and reaches to wall; nickel-plated brass 5/8 in. long shank compression sink. Fuller faucets; nickel-plated brass 2 in. adjustable trap to wall for iron pipe; nickel plated standing overflow and waste in recess in back of sink.

There are also vitreous porcelain sinks 25 x 17 x 5½ in. deep with nickel-plated waste plug and coupling; chain stay and stopper; supported with enameled iron standard; supply hot and cold water through nickel-plated compression goose-neck faucets, with china name plates marked "Hot" and "Cold" waste through nickel-plated brass adjustable trap to wall for 2 in. iron pipe. These sinks are equipped with drain boards.

The sinks in kitchen and scullery are wrought iron 36 x 24 x 18 in. deep, with waste plug and coupling and galvanized iron P trap to wall; each compartment is supplied with hot and cold water through ¾ in. Fuller pattern faucets, with all-metal handles and hose end on cold faucet. Sinks are supported with wrought iron frames and legs and waste through galvanized iron 3 in.

connections and grease trap; porcelain lined inside and white enamel painted outside, equal to the finish as applied to bath tubs and have 2 in. galvanized iron connections to wall.

The sinks in scullery are same type, but of four compartments, supported with galvanized iron frame with flange standards. The supply pipes set above partitions and have stop valves with stems for detachable keys and lock shields.

The drain boards are of heavy grooved ash, with curbs and polished brass angle clamps and polished brass rods with nuts; supported with 1½ in. diameter galvanized iron standards, with heavy flanges at floor.

There are also sinks of extra heavy vitreous porcelain 30 x 26 in., with vit-

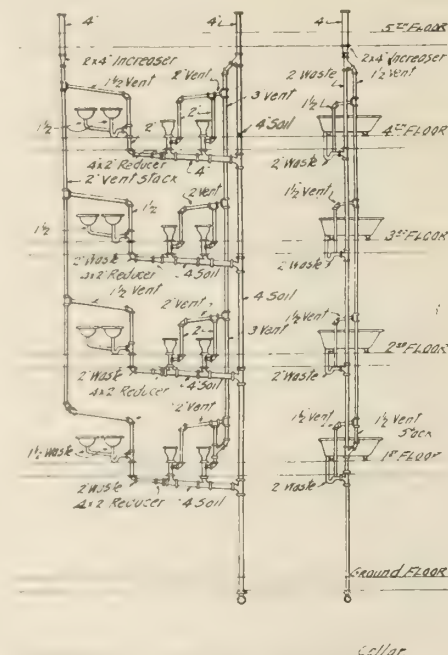


Fig. 2.—Typical Soil, Waste and Vent Risers.

reous porcelain legs; nickel plated brass waste strainer, plug and coupling; nickel-plated brass 2 in. adjustable trap to wall for iron pipe; nickel-plated brass 5/8 in. compression sink faucets, with china name plates marked "Hot" and "Cold," with ash drain board, nickel-plated brass wall hinges and telescopic legs.

There are also some porcelain sinks with porcelain legs; nickel-plated brass wall supports; nickel-plated clover knee action supply valve, with stirrup handle and nickel-plated low down spout; pipe from valve to spout and supply pipes to wall, with stop valves, nickel-plated lock shields, nickel-plated brass 2 in. adjustable trap to wall for iron pipe.

Another type of sink is of porcelain 26 x 23 x 7 in., porcelain legs; nickel-

plated brass wall supports; nickel-plated clover knee action supply valves, with stirrup handle, nickel-plated goose-neck with extra large removable rose spray; 8½ x 2½ in. nickel-plated supply pipes to wall with stop valves, with nickel-plated lock shields, nickel-plated supply pipes from valve to goose-neck, nickel-plated clover knee action waste; nickel-plated adjustable trap to wall for 2 in. iron pipe.

Another type used is a porcelain sink 30 x 27 in., with nickel-plated standing overflow and waste in recess at end; nickel-plated standard; nickel-plated brass goose-neck compression pantry sink faucets, with china name plates marked "Hot" and "Cold"; nickel-plated brass 2 in. adjustable trap to wall for iron pipe; nickel-plated supply pipes to wall, with angle stop valves, with nickel-plated lock shields.

The flushing rim sinks are extra heavy vitreous porcelain with integral overflow, size 16 x 20 x 10 in. deep with 2 in. brass waste plug and vitreous porcelain strainer, nickel-plated brass ¾ in. angle valves to control supply to flushing rim and nickel-plated brass combination compression supply faucet, with china name plates and porcelain standard; nickel-plated brass 2 in. adjustable trap to wall for iron pipe; sink fitted with oak drain board, with white enamel bracket.

There are also some enameled iron roll rim sinks 30 x 20 x 6 in. deep, with integral back; cast iron legs; nickel-plated brass waste strainer, plug and couplings; nickel-plated compression Fuller faucets, with all-metal handle; nickel-plated brass 2 in. adjustable trap, with nipple to wall, with iron pipe. The exterior of sink and legs is white enamel painted of the same finish as applied to bath-tubs.

A few galvanized iron sinks are 24 x 20 x 12 in., with trap standard and patent overflow; galvanized iron back and legs; polished brass 5/8 in. tee handle compression faucets, with hose end on cold faucet, galvanized iron P trap with nipple to wall threaded for iron pipe.

The last type of sink is an extra heavy vitreous with integral back and trap to wall, with nickel-plated flush valve, with integral stop valve and nickel-plated brass valve, with integral stop valve and nickel-plated brass supply pipe from cleansing jet to wall, with rough brass hot and cold supply valves, with removable bonnets, with china name plates marked "Hot" and "Cold."

The slop sinks are porcelain roll rim 24 x 20 x 12 in., with trap standard and nickel-plated brass waste strainer, trap standard with nickel-plated brass combination compression faucets with china name plates marked "Hot" and "Cold" and with pail hook and brace to wall,

trap standard to be white enamel painted, same as the finish applied to bathtubs.

The showers are nickel-plated 5 in. diameter rain-head type, with cast brass removable slotted face and nickel-plated brass new model mixing valve, with index plate shower with adjustable ball joint. The mixing valve is placed on the side wall and fitted with nickel-plated stop valves, with nickel-plated lock shields and with nickel-plated mixing column from control valve to shower head; each stall is fitted with a nickel-plated brass 5 in. waste strainer with 3 in. plug and coupling and with nickel-plated brass 1½ in. curtain rod with end flanges and nickel-plated snaps and white duck curtain. The curtain is weighted at bottom with shot.

The washtubs are porcelain 30 x 26 in. with porcelain legs; nickel-plated brass waste strainer, plug and coupling with china stay and stopper, nickel-plated brass ⅝ in. compression faucets, with china name plates marked "Hot" and "Cold." The wash tubs have nickel-plated 2 in. adjustable trap to wall for iron pipe and those in batteries have nickel-plated 2 in. waste pipe with ½ Strap to wall, with heel inlet on one tub and with waste on other tubs in the battery connecting with this trap.

Water Supply System.

The water pipe is of standard weight galvanized iron pipe, the fixtures supplied with water on the basement ground floor, and first floor being under direct pressure, and the fixtures in the second, third, fourth and fifth floors being supplied from a pressure tank system, located in the cellar. A layout of the pressure tanks, pumps, etc., is shown in Fig. 4. All the main lines of supply pipes with their branches are of galvanized iron, as previously stated, but flush pipes are nickel-plated brass.

Where the water pipes are exposed to the weather or liable to freeze they are covered with cork covering. The hot water is supplied from a system independent of the two various cold water pressures, and the main hot water supply line to the building is extended through the finnel to a hot water service heater outside the structure. Wherever the hot and cold water lines are run parallel to each other they are separated by at least 6 in. or else the hot water lines are covered with an insulated covering. All the riser lines starting from the basement on both the hot and cold water system, are separately controlled by gate valves at the base of the line.

All the hot water piping is installed with circulating returns, the circulating line paralleling the riser line and the main circulating line paralleling the riser line and the main circulating return

is carried back to the mouth of the tunnel. In general the water piping is carried in recesses and under the flooring, and when carried under the floor is placed in trenches with a space around to allow for expansion and contraction. All the hot water lines placed under the floor are covered with insulating material.

The cold water supply is brought in from the cast iron main located in the street through a 4 in. line which separates in the basement into branches running to the plumbing fixtures, storage tanks, etc. A water meter is set in the main service line with gate valves and a fish trap. On the house side of the meter is provided (in connection with the cutoff gate valve) a horizontal swing check, which is placed between the meter and the gate valve.

In the basement is set up a double tank storage system, as shown in Fig. 4, consisting of two water tanks, 1 air tank, 1 water pump, 1 air compressor and a pressure controlling device. This

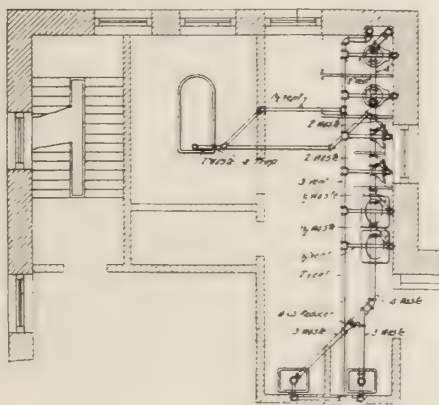


Fig. 3.—Typical Bathroom and Piping.

system has been proportioned so as to meet the following requirements:

The combined water storage capacity of the two tanks is about 8,000 gallons; the combined capacity of one air tank when charged with compressed air at a maximum pressure of 125 lbs. is such as to yield an expulsive force which is sufficient when operating on the water in the water tanks (and while the water pump and air compressors are at rest) to discharge all the water in the water tanks under a steady and uniform maximum pressure of 40 lbs.

The air compressor takes the air from the water tank under the pressure maintained and which air has passed over and into the water tanks from the air tank through the pressure-regulating device while the water tanks are being discharged and returns such air into the air tank.

The pump for supplying the water for the storage tanks takes the water from the suction tank or street main con-

nection and pumps it into the tanks against the pressure which they normally carry. On the line of the communicating air pipe between the air tank and the water tank a device is provided which regulates the flow and the pressure of the air in order to maintain a uniform maximum pressure of 40 lbs upon water in the water tanks during the time in which they are being discharged. The general features of the water and air tanks are briefly as follows:

Each tank is 6 ft. in diameter and 20 ft 4 in. in length over all. The heads are dished and of ½ in. thickness on the air tank and 7-16 in. on the water tanks. The shells have horizontal seams with butt joints, double strapped and tripple riveted, with vertical seams single riveted. The shells for the air tank are made of 13-32 in. metal and of 5-16 in. metal for the water tanks. On the bottom of the water tanks is placed a 4 in. flanged steel nozzle for water pipe connection, and in the side of both the air and water tanks is located a 11 x 15 in. manhole. On the head of each water tank are placed 2 sets of 1½ in. gauge glass fittings.

The water pump is a 5¼ x 7 x 4½ x 10 in. compound steam pump with a capacity of about 125 gallons per minute at 100 lbs. pressure when supplied with steam at 90 lbs. The pump has brass lined water cylinders, bronze piston rods, iron water piston fibrous packed, brass seats, stems, valve covers, springs and high grade rubber valves with cold water. The discharge line between the pump and the water tanks is of 4 in. with a check valve at each water tank, while the suction line is also 4 in. and has a gate valve. The pump is supplied with 1¼ in. steam and has a 2 in. exhaust.

The air-compressor consists of a 6 x 5 x 5 in. "Duplex," steam driven fork frame compressor operating at 150 revolutions per minute and having a displacement of 27 cu. ft. of free air with a terminal pressure of 125 lbs. with a pressure on the suction of 40 lbs. and operating under 90 lbs of steam. Compressor is supplied with steam through a 1¼ in. connection and has a 1½ in. exhaust. A 1½ in. air pipe is run between the air compressor water tanks and air tank with globe valve on the suction and discharge lines and free air connections at the air compressor for the pipe to air the filter room. On the air line between the water tanks and the air tank is placed a 1 ½ in. pressure regulating valve and a controller.

All the piping used on these lines, both water and air, is standard weight wrought iron pipe galvanized, the fittings up to and including 2 in. being of cast iron galvanized screwed, while above 2 in. they are galvanized flanged, all

being standard weight. The valves up to and including 2 in. are brass body screwed and over 2 in. are iron body flanged.

Fire Protection System.

A system of fire lines is installed with protects the entire building being connected with the storage tank system, the street main in the basement, and with a Siamese connection at the front of the building as shown in Fig 4. All pipe

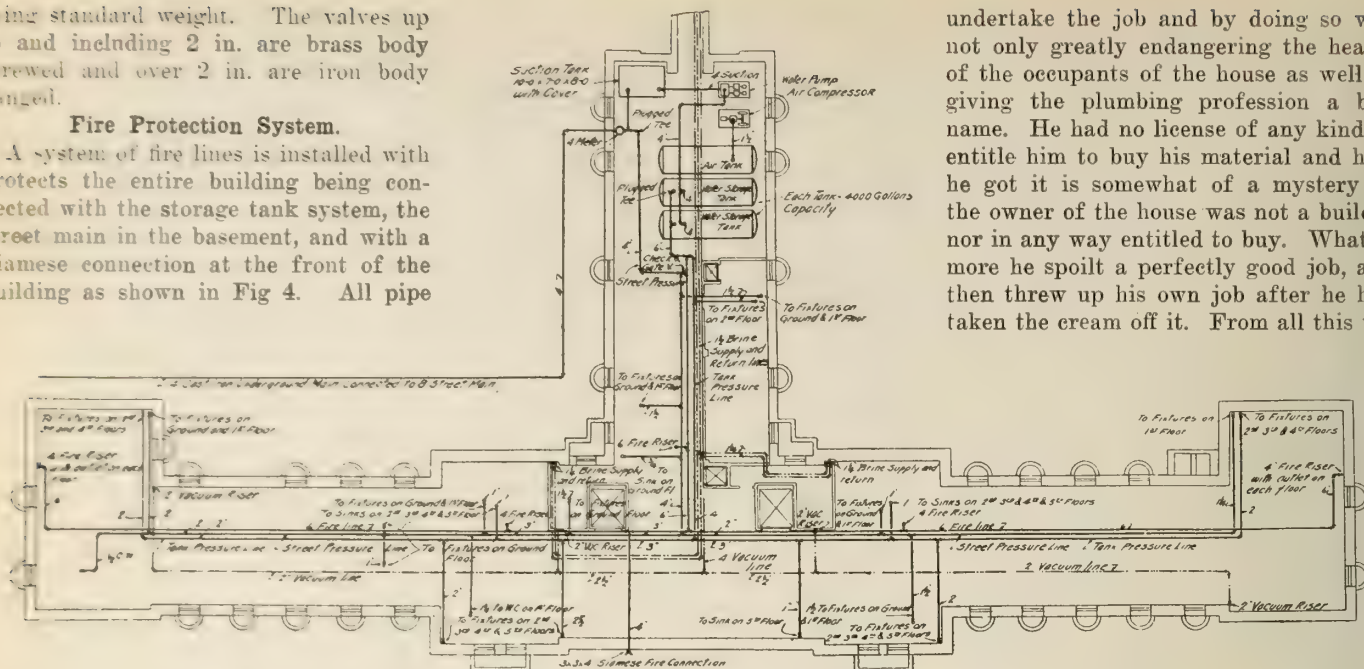


Fig. 4.—Basement Plan of Water, Fire, Brine and Vacuum Piping.

used on this system is genuine wrought iron, full weight black pipe with extra heavy couplings. At each outlet is placed a hose valve and a hose rack nickel-plated with a supply of 2½ in. double jacketed cotton rubber lined hose capable of standing 400 lbs. per sq. in. All the nozzles are of the Underwriters pattern with swivel handle and smooth tapering thread being 30 in. long and having a 1½ in. board.

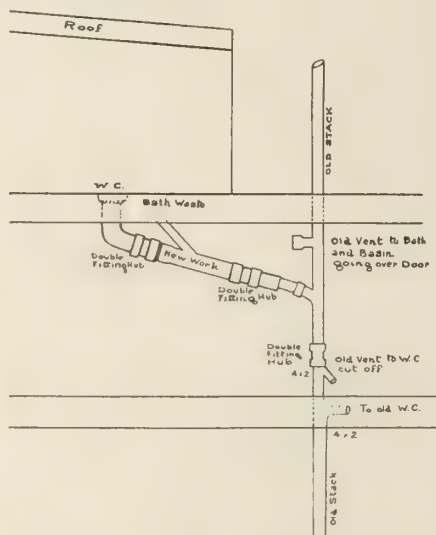
A Sample of Poor Workmanship

You can always tell a poor plumber—but you can't tell him very much. Recently, a job which serves as an excellent illustration of this has been brought to the notice of Plumber and Steamfitter.

The owner of the house wished to put in a new closet in the bathroom, install the old one in the basement, and also have a bathroom on the third floor. The plumbing in the house was a perfect job only some five or six years old, and showed in every way fine, careful workmanship. To do the work, the owner employed a man whose experience had been limited and amounted to about as much as the training a man would get through sleeping in the same house with a plumber for six months.

To begin with, he took out the old closet, a Richelieu, and put in an ordinary up-to-date low down closet, first having soldered up the old vent to the Richelieu but leaving in the 4 x 3 inch Y

upside down and next to it a double hub fitting. Farther up the stack he put in a 4 x 4 inch Y to make connections with the bathroom to be installed on the next floor, and was careful to leave in the 4 x 2 inch T on the old stack which had vented the bath and basin on the other side of the room. This should have come out, as any ordinary mechanic would see that water would run over the 4 x 2 inch vent down to the bath and basin trap if choked down below. On the horizontal run he had two more



double hub fittings which again is contrary to by-law. Here he quit the job, and by the looks of things he had never intended to vent the new fixtures in new bathroom either.

Now this work seems so crude that an explanation of how it should be done seems unnecessary. The point is that such a man had no right whatever to

undertake the job and by doing so was not only greatly endangering the health of the occupants of the house as well as giving the plumbing profession a bad name. He had no license of any kind to entitle him to buy his material and how he got it is somewhat of a mystery as the owner of the house was not a builder nor in any way entitled to buy. What is more he spoilt a perfectly good job, and then threw up his own job after he had taken the cream off it. From all this the

necessity of trade organization, and the passing of some examination which will put a standard on labor efficiency becomes more apparent. Such men are doing the trade more harm than good, to say nothing of the danger to which lives are subjected through the free admission of sewer gas.

COAL CONSUMPTION AND AMOUNT OF RADIATION.

Editor, Plumber and Steamfitter.—Can you give me any figures on the amount of coal that will be used as compared with the amount of radiation in a building? Also is it cheaper to use soft coal than to burn the hard coal?

J. A. Downing

We believe that it has been found by those who have made some extensive inquiries on the subject that a good grade of soft coal will furnish steam at a much cheaper rate per ton than the hard, or Anthracite coal. In some cases the difference has proved to amount to over \$3.00 a ton.

It has been found that the average fuel consumption in the dwellings varies from two and one-half to four tons per hundred square feet of radiation. The difference given would come from such causes as climate, care of the job, the manner in which it was installed, the kind of boiler used and various other causes. As to just what this coal consumption costs in dollars and cents one will have to be governed by the price of the coal, locally. It would be cheaper in the eastern than in the western part of the country, provided eastern coal was used in both places.

D. C. H.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

DISPOSING OF THE GARBAGE.

Editor, Plumber and Steamfitter.—Kindly inform me as to whether or not there is not some other manner of disposing of the garbage than by dumping it into a box located at the back end of the lot and emptied whenever most convenient? Householder.

There certainly is. Evidently you and your local plumber have not met on this question, or perhaps he, like many others in the same business, is not inspired with the most progressive spirit. If you will take occasion to examine the advertising section of this paper from time to time you will there see

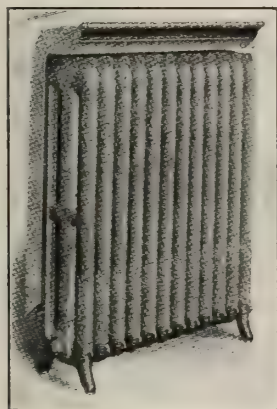


Fig. 1.

pictured some of the most modern garbage disposal outfits which can be used for your purpose to the greatest advantage. The garbage can be burned in a boiler that is made especially for the purpose, thus doing away with the nuisance of having the box you mention.

D. C. H.

WHERE TO PLACE THE STORAGE TANK.

Editor, Plumber and Steamfitter.—Shortly I am about to install an air pressure system of waterworks for a certain party. He is very much in favor of having the water storage tank sunk in the ground outside of the building. Would not the cellar be a better place for the tank? X

We know of many such jobs where the tank is sunk in the ground as you

describe, and the results have generally been very satisfactory. On smaller jobs, however, we believe that we should prefer to have the tank in the cellar, if there was plenty of room, as, in case that any repairs became necessary, it would be much easier to get at the tank or connecting valves or pipes.

D. C. H.

AMOUNT OF RADIATION ESTIMATED FOR EXHAUST STEAM.

Editor, Plumber and Steamfitter.—Will you favor me with any information as to the amount of radiation that can be heated by the exhaust steam from an engine in a factory? O. W.

You mention nothing about the size of the engine, which should be known in order to give exact results. However, along this line Mr. A. G. King remarks, "Allow from 100 to 125 feet of direct radiation per horse power of the engine, having the pipes covered. Mr. King further says that a one hundred horse-power engine, working normally, should furnish exact steam enough to heat ten thousand square feet of direct radiation."

D. C. H.

PULLING AIR FROM STEAM PIPES.

Editor, Plumber and Steamfitter.—It is the custom to place an air valve on the far end of a steam return pipe to take the air out of the pipe line. In some cases I have noted that the air valve does not accomplish the purpose. What was the matter? Valves.

It must have been a pipe of quite large size. In such cases the steam will pass along the top of the pipe, while the cold air remains along the bottom. To relieve the situation drop a small pipe down to the bottom of the main, making said pipe in connection with the air valve.

D. C. H.

MOISTENING STEAM HEATED AIR.

Editor, Plumber and Steamfitter.—In some of the houses that are heated by steam, the air seems to get greatly burned out. Can you give me any suggestion as to how to make such a situation any better? T. C. Mc A.

Several years ago the writer was in the habit of placing a basin of water on the radiator in such cases. This idea has been used by some of the large concerns that make radiators and in Figure 1 we show an arrangement of the kind which not only embodies the pan and vapor idea, but also acts as a shield to prevent the air currents from "smoking" up the wall back of the radiator.

D. C. H.

Editor, Plumber and Steamfitter.—Will you be kind enough to show me



Fig. 2.

some practical manner in which drinking fountains are controlled. J.B.F.

In figure 2. we show one type of drinking fountain which is controlled and operated by a pedal valve located in the base. Depressing the pedal allows the water to flow. At other times the water is shut off.

D. C. H.

FUEL COSTS vs. CONSTANT OR INTERMITTANT HEAT.

Editor, Plumber and Steamfitter.—Some time since I put a steam heating job in a large church. There has been

considerable discussion among the trustees as to whether it was cheaper to heat the church all the week, or to heat it only on the days or evenings on which the building was used. Can you give me any information on this subject from any data that you may have on the subject?

January

Upon this subject there are a variety of opinions. We believe that it would depend, somewhat, upon the efficiency of the heating apparatus, but granting that it is all O.K., and that the church will be used once or twice per week, besides Sundays, we are of the opinion that it would be found to take less fuel to heat the building constantly. Of course, this does not mean that as high a temperature will have to be maintained when the building is un-occupied as when in use; but it should be heated sufficiently so that the walls will not get cold.

If it is a case of where the fire is allowed to go out, you should figure an excess of at least one-third more radiation in order to do the heating satisfactorily. In several experiments that we have known of in heating apparatus where this very point has been tried out it has been found in almost every instance that it took less fuel to heat the church all the week than it did to heat it only when services were to be held, heating all the week being understood to mean as previously explained in this answer. Another point that you will do well to bring to the attention of the board is that when the apparatus has a constant fire in it, there is no danger of anything freezing, and that the entire apparatus will not deteriorate as rapidly if used all of the time.

D. C. H.

ESTIMATING COST OF EXCAVATING.

Editor, Plumber and Steamfitter.—Having to include in an estimate some excavating, I would appreciate an answer to the following question through your query columns, if possible:

Having a watermain to lay 4½ feet deep and some hundred yards long, what is the average or the usual way of estimating for excavation work? Is it estimated at so much per cubic yard to be removed?—T. Knapton, Thornhill, Ont.

If your watermain is two inches or more in size, thus rendering digging a necessity, I may state that an average digger can throw out from six to ten cubic yards of sand or easy earth per day of eight hours. In filling back the earth a good workman should average from twelve to sixteen cubic yards per eight hours. In shallow work (meaning

five feet or less) the output of the men can be figured at least 50 per cent. more, but the fillback must be figured as the same.

If a laborer is paid \$1.50 per day of eight hours and can put out eight yards of earth, the cost of the mere digging would then be about 19 cents per yard. The cost of the back filling will run about 12 cents. Thus, total cost per cubic yard will be about 31 cents. Find out the number of yards you have to move and (provided labor conditions are approximately the same) you will have a pretty close figure on what it will cost you in the case in question.

You can then submit your bid in any form you wish—totalled for the job, or done by the day or by the yard.

D. C. H.

SHOULD A DRY OR A WET RETURN BE USED?

Editor, Plumber and Steamfitter.—Where it is necessary to run a return

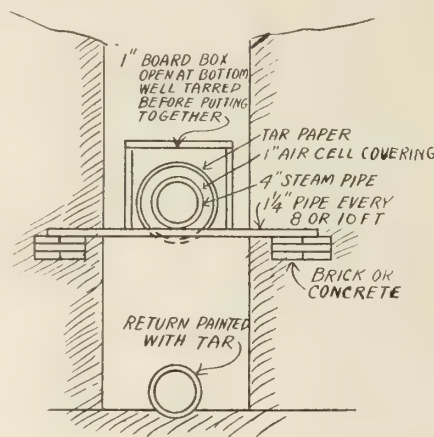


Fig. 3.

back to the steam boiler do you consider it better to run the return dry or wet? Fitter.

Jobs differ, and what might work out all right on one plant might not answer at all on some other kinds. This is where the ordinary fitter makes one of his most serious mistakes. He fails to differentiate, and many times puts them in all after the same fashion.

If it so happens that you have a case where the cellar is low and the steam main, consequently, is near the water line, it would not be policy to attempt to run a dry return. Yet in many cases we have observed that this was done, and a poor job was the result as a natural consequence. In general, in most cases it can be stated that it is a good policy to get the return back to the boiler by the shortest route and with as few turns in the line as possible.

D. C. H.

From the evidence in your letter we should imagine that this was a place

where the house lines had main traps. We are of the opinion that the sewer should have been vented along the main line at regular intervals. Some of the very best authorities on this particular subject have no hesitation in stating that the closed sewer should not be tolerated.

D. C. H.

PAINTING OR BRONZING CAST IRON SOIL PIPES.

Editor, Plumber and Steamfitter.—When I painted some soil pipes not long ago it all turned a blue-green color after a few days. A second and third application of the paint did no good. Will you tell me how to do the job right?

A Helper

The discoloration is due to the coating in which the pipe was dipped before it left the manufactory. If you had tried to bronze the pipe it would have acted approximately the same way. In order to avoid having the pipe discolor it will be necessary to clean it thoroughly before applying at least two coats of shellac. The pipe may then be painted or bronzed as may be desired and the color will remain as applied.

D. C. H.

THE MEANING OF THE WORD "SLUDGE."

Editor, Plumber and Steamfitter.—In reading your paper I sometimes run across the word "sludge." Will you please explain the meaning of the word in an early issue of the paper?

Reader.

It has reference to a part of the composition that is in a septic tank that is used for the disposal of sewage. When the sewage enters the septic tank from the sewer a bacteriological action takes place by which the sewage is divided into thin and thicker parts. The heavier part settles, and this is what is known as the "sludge." D. C. H.

CLOSET WITH CLEAR FLOOR SPACE.

Editor, Plumber and Steamfitter.—A certain customer of mine has asked me if I could obtain a closet that did not rest on the floor. I wish that you would show one, and give me any advice possible on the subject.

J. James.

In Fig. 3 we show a closet of the description desired. This form of closet does away with joist cutting, stands clear from the floor and has been used in many large installations of plumbing work.

D. C. H.

Complete Course in Sheet Metal Work

By L. W. KOSER

Fig. 1 shows the detail of the common bar with the glass resting on same and the cleat Fig. 3 fastened into the top member and the cap Fig. 4 set in place.

A slot is punched in the top of the cap at Fig. 4 to allow the cleat to pass through and then the cleat is bent down on each side of the cap fastening same. These cleats are made from 16 oz. sheet copper.

Fig. 2 gives the details of the side-bar. Very often common bars are used as side-bars but do not make as neat or weather-tight a job.

At Fig. 7 we show the pattern devel-

oped for the top and bottom of the common bar.

Skylights are usually drawn one-third pitch or about 30 degrees.

First draw the centre line "a" the desired pitch.

To get this pitch draw a horizontal line A-B (Fig. 8) 18 in. long; at B erect a perpendicular line 12 in. high then a line drawn from C to A is one-third pitch.

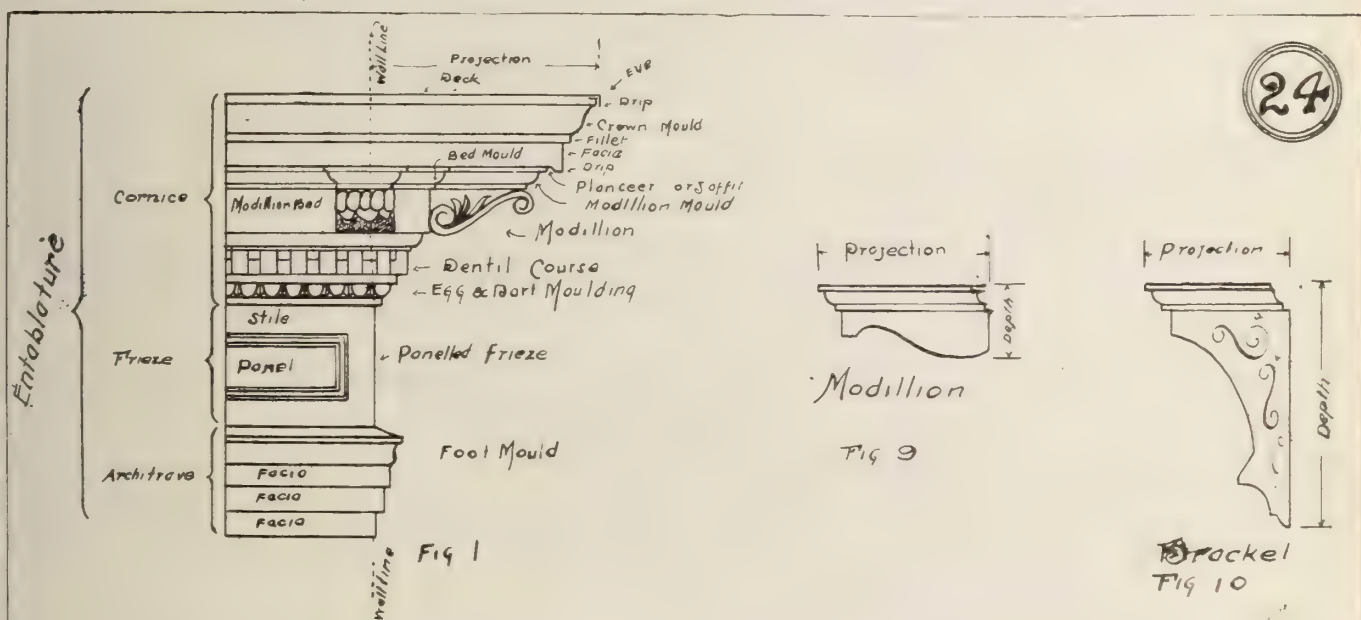
As this is a good time to make the metal worker acquainted with the meaning of the different expressions used by carpenters and builders when they refer

to the pitch of a roof as being $\frac{1}{4}$, 1-3, $\frac{1}{2}$, $\frac{3}{4}$ or full pitch, we will side step a minute from the skylights to explain this.

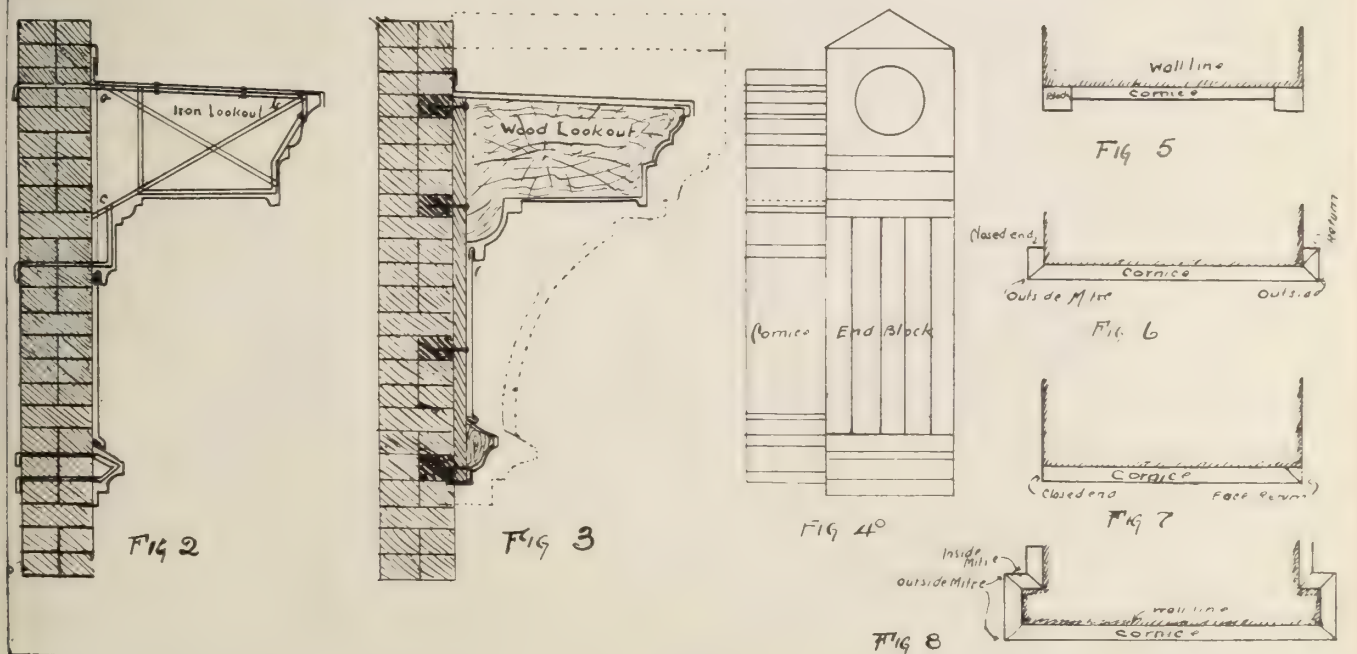
At Fig. 9 we have drawn a triangle or the distance from X to K is just $\frac{1}{4}$, 1-3, $\frac{1}{2}$ or $\frac{3}{4}$ of 12 ft.

For instance, a building 12 ft. wide with a $\frac{1}{4}$ pitch roof would mean that the "rise" was $\frac{1}{4}$ of 12 or 3 ft., while a 1-3 pitch would mean that it was 1-3 of 12 representing two sides of a roof or a gable end. S and H represents the eaves, and K the ridge.

The distance between S and H represents the width of the building. From



THE CORNICE & ITS DIFFERENT FACE MEMBERS



X to K represents what is called the "rise."

We will suppose that the width of the building is 12 ft. Now a $\frac{1}{4}$, a 1-3, a $\frac{1}{2}$, a $\frac{3}{4}$ or a full pitch means that the rise is or 4 ft. and so on. A full pitch means that the rise is as high as the full width of the building or in this case, 12 ft.

From the foregoing explanation Fig. 8 should be readily understood. The 18 in. represents only half of the width of the gable which would be 36 in. or 3 ft. Consequently, a 1-3 pitch would mean 1 ft. or 12 in. rise in the centre.

Now having drawn line A Fig. 7 we erect at right angles to it, the detail of the common bar and number each bend.

Then extend parallel lines from each point indefinitely each direction.

The line "a" is where the glass rests on and is called the glass line. It is

furthermore the line on which all skylight measurements should be taken.

Now draw in the ridge and curb so the glass will rest on the shoulders of each and provide a flange for the bottom member or gutter of the common bar to rest on.

Number each of the points of the common bar where they butt into the ridge and curb. Now draw the stretchout line J K of Fig. 10 and transfer the stretchout of the common bar to same and number each point. Project lines each way from these points.

Now place your angle or T square so that it will run parallel to the line J-K or at right angles to the line "a" and bring it against each point on the ridge and curb where the common bar touches same and cut the line having the corresponding number on the stretchout.

Connect these points and the pattern is developed.

A small skylight can be made out of paste board for practice.

On plate 26 we show at Fig. 1 an illustration of a Double Pitch Skylight. This is so near like a Single Pitch Skylight that but one additional pattern needs to be developed to complete it.

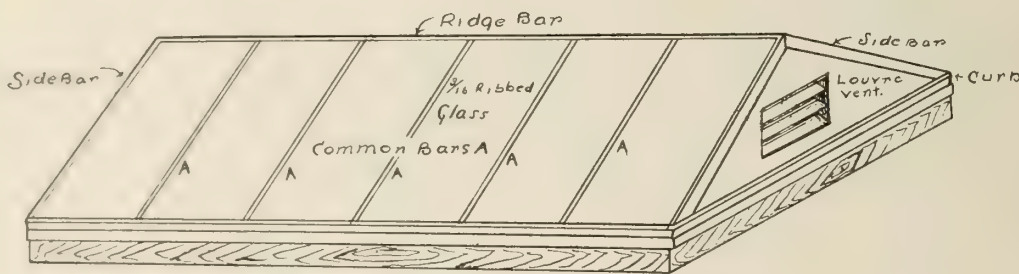
This pattern is the corner mitre for the curb and is developed the same as a square mitre for a cornice.

Fig. 2 shows the profile and Fig. 3 the pattern developed in the usual way.

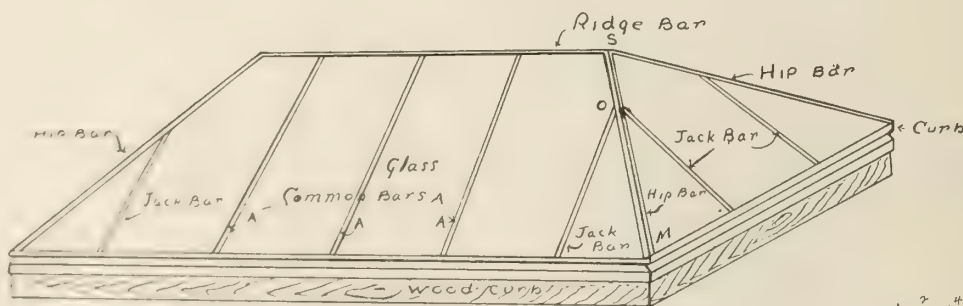
The ventilator at the end is simply slots set in at an angle. These are sometimes pivoted in the centre and opened and shut after the principle of common window shutters.

(To be continued.)

26



DOUBLE PITCH SKYLIGHT FIG. 1



HIPPED SKYLIGHT FIG. 4

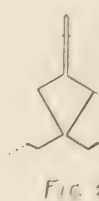


FIG. 5



FIG. 6
Hip Bar



FIG. 7

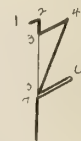


FIG. 2

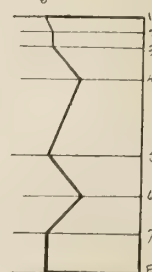


FIG. 3

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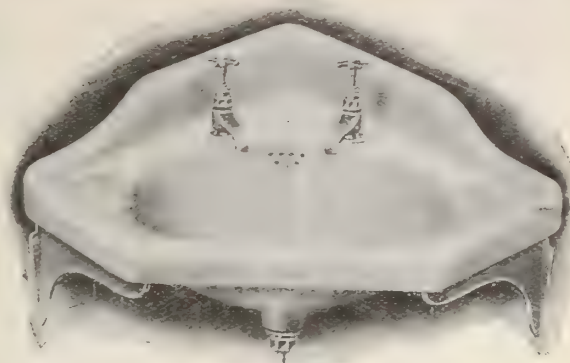
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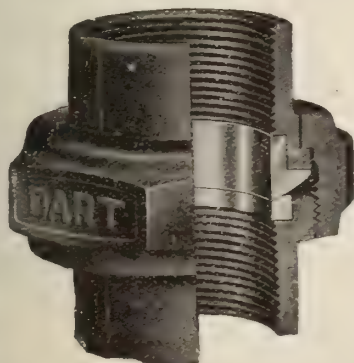
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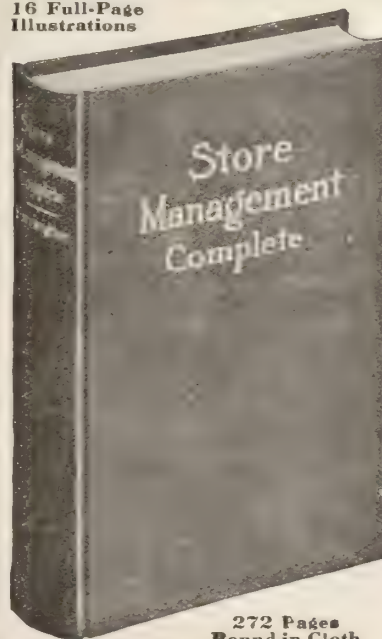
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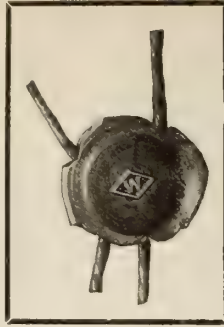
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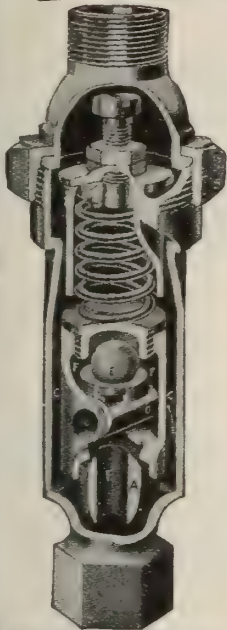
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See Sweet's Index, Pages 1139, 1140, 1141.



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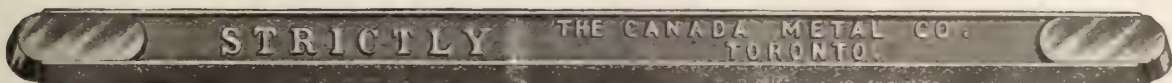
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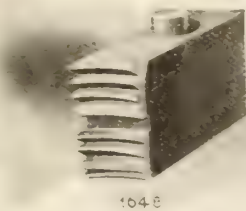
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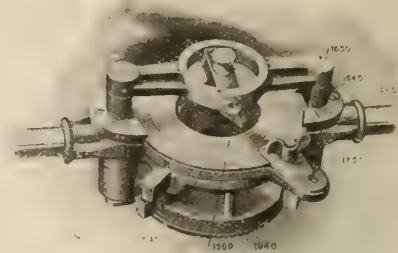
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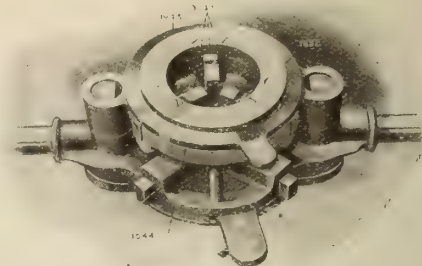
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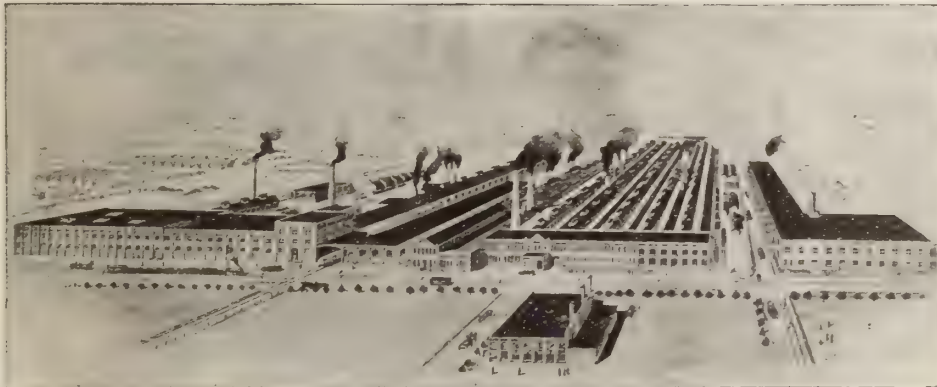
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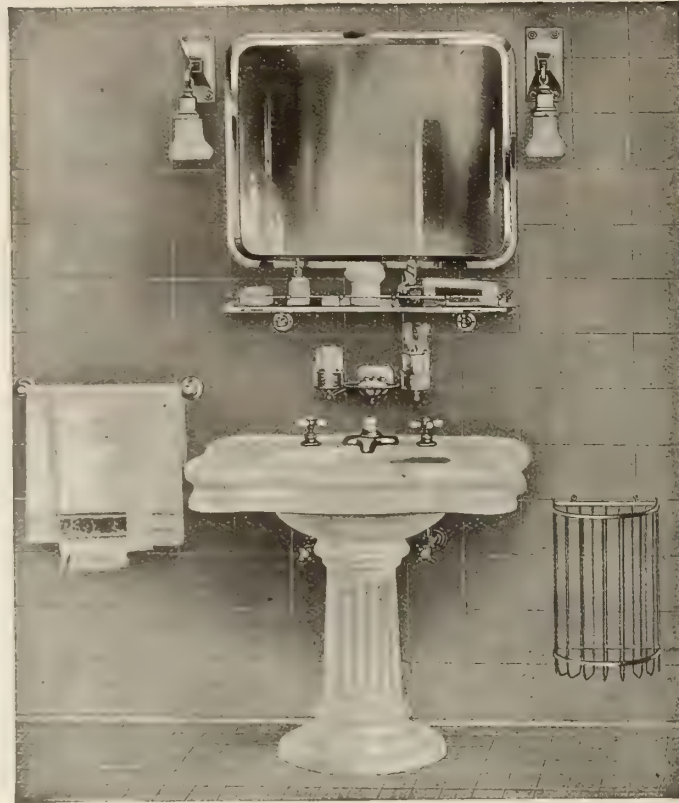


Plate P-3070 X.

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The Ash Pit is large and roomy, with a wide door, so that the ashes may be easily removed.

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The Daisy Firepot is made of such depth that all the gases are consumed in the combustion chamber, resulting in a high temperature of the water on a minimum consumption of fuel. On the inside of the firepot are vertical ribs, of sufficient size to allow the air to rise freely through the coal at the outside edge of the fire, keeping it burning evenly and preventing the accumulation of ashes near the water in the fire-pot section.

The Daisy is a guarantee of efficiency and durability.

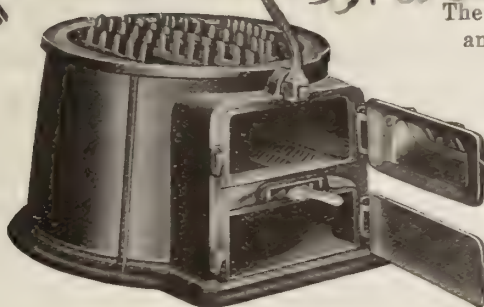
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Sample of
this Business
Builder in Stock

The advantages of this boiler are certain to cause your customers to give it the preference—you reap a good, clean, satisfactory, profit and will be selling a boiler that will be an advertisement to your business.

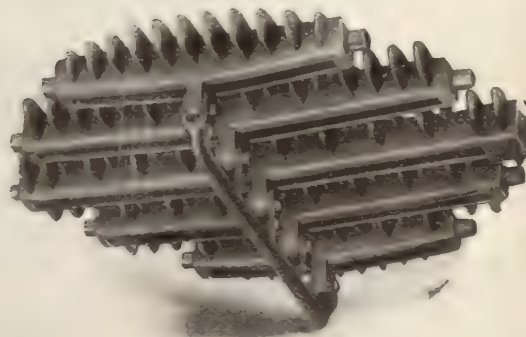
The "Daisy" is the result of over 50 years' careful study of the hot water system of heating. Many exhaustive tests were made before the perfected boiler was placed on the market.

Our reputation and guarantee stand back of every "Daisy" Boiler which we sell.

It is easy to make "Daisy" sales.



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SHOWING ASH SIFTER AND GRATE



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When all the claims are made—and all the talking is done—and it comes to an actual comparison of the valves themselves, you will readily see how efficient service and unfailing reliability are positive features in

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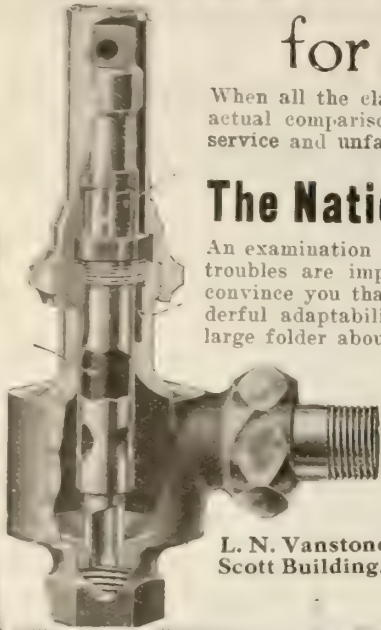
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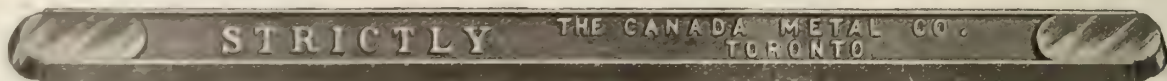
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Never let a man tell you he cannot afford to install our Condensation Pump; the fact is, he cannot afford to be without it. It is far cheaper to pump Condensation water and air out of the system by electricity than it is to carry high steam pressure to force it through the Radiators and return lines. Steam is expensive! Coal and firing—labour are large items!

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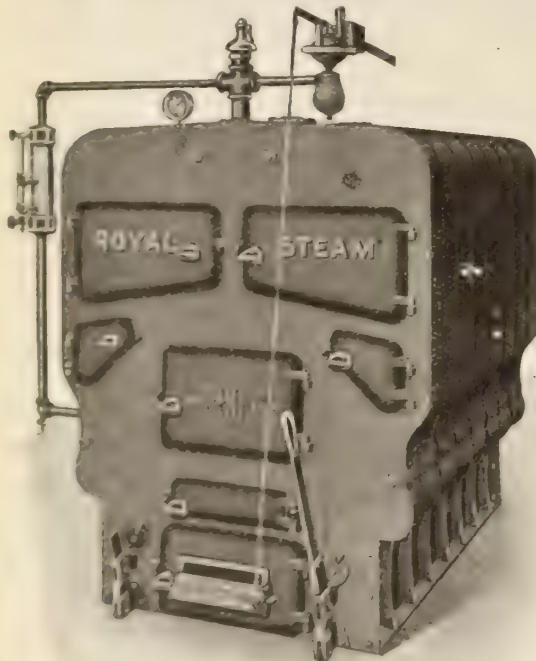
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It is apparent now that the demand for Boilers and Radiators will be greater than last year.

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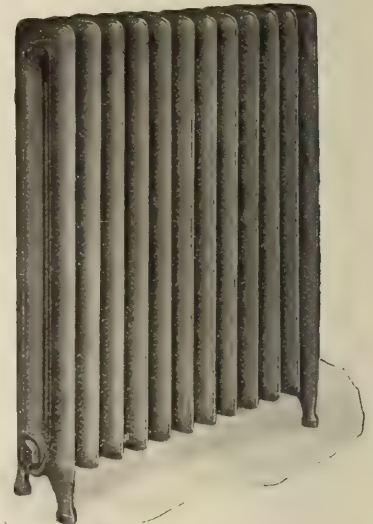


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We would draw attention to our new "Imperial" Radiator, made only in one and two column plain, in every height. See cut showing clear cut lines and clean, smooth castings.



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Groups of convention delegates taken on Good Friday.

Ontario Convention Proved a Great Success

Enrollment Showed 178 Members—Most Places of Importance in Ontario Were Represented—Much Business of Importance Transacted—Reports of Committees Dealt With—Salaried Secretary and Organizer May be Appointed.

THE regular Annual Convention of the Ontario Society of Domestic Sanitary and Heating Engineers was held in Toronto on March 20, 21 and 22, and so large was the gathering, and of such a representative nature that the most sanguine expectations of the directors were completely fulfilled. The fact that five years ago no society existed, that four years ago three or four men met together in Toronto and discussed the advisability of forming a provincial association, and that the present society formed two years ago with a membership of 33 has grown so that there are now enrolled 178 members, shows to some small extent the success which has been attained and the advancement which is being made. As expressed by T. J. Minnes, of Brantford, at the convention, there is a feeling all over the country that the trade should get together and work together for the good of all. This feeling, together with the growing prosperity of the Ontario Society, gives every appearance of absolute assurance for the future success of the Association.

There were men present from all parts of Ontario. Fort William and Port Arthur on the West and Ottawa on the East, were well represented. Not only were there big delegations sent from the larger cities, but the small towns as well were represented and by men who took an active part in all the discussions which came up before the convention.

THURSDAY afternoon was devoted chiefly to enrolling of members, addresses of welcome and open discussion. On Friday the convention got right down to work, and in two long sessions put through a tremendous amount of business. Reports showing good work and very marked progress were brought in by the directors, L. Le Grow, F. Maxwell and Wm. Mansell. So satisfactory were these to the different members present that a very hearty endorsement was given. The chairman of the various committees also reported general progress in each of their branches, and brought in various recommendations with regard to the way

in which the good work should be continued in the future. A large amount of new business was put through, and upon some of this much importance rests. The opinion that a permanent paid secretary was a necessity was unanimous, and the convention left it in the hands of the new directors to appoint and provide for such an officer. The new retail price schedule of the Toronto Committee met with general favor, and the society decided to adopt such schedule, making necessary changes to meet the various localities.

Throughout the whole convention, perhaps the most important feature was the record attendance and the enthusi-

astic discussion of all points of provincial and local interest.

Opening of Convention.

The convention opened in Victoria Hall on March 20, at 3 p.m., with President Le Grow in the chair. After a brief welcome extended by the President to the various members, Controller T. Church, vice-chairman of the Board of Control, Toronto, was called upon to open the meeting. In a few words on behalf of the city, he welcomed the convention to Toronto and extended to the various members the freedom of the whole city during such time as the convention should last. Further, he spoke of the aims and objects of the

society, pointing out that they were not only largely important, but patriotic, and a great boon to the public at large. He looked to the sanitary and heating engineers to build up the cities of the province, and wished the society success and great prosperity in all its labors.

Alderman Sam Ryding then further confirmed the hearty welcome extended by Controller Church, and not only in his official, but in his individual capacity, welcomed "the boys" to Toronto.

The list of those present was then read and to serve as a general introduction, each man was asked to stand as his name was read out.

Apart from the appointment of Select and Resolution Committees little business was transacted on Thursday. The members appointed to act on these committees were as follows: Select—T. J. Minnes, Brantford; C. F. Needham, London; J. T. Aggett, Toronto, and A. Malcolm, Guelph. Resolution—E. H. Russell, London; I. J. Ross, Galt; John Hainsworth, Berlin; J. McKinley, Ottawa, and A. S. Bates, Bracebridge.

The remainder of the afternoon was devoted to open discussion, and to the presentation of a paper by Wm. Meadows, Supervising Inspector of Toronto City Plumbing Department, on the "Benefits Derived from Plumbing Regulations." Further particulars appear elsewhere.

Friday Morning Session.

On the resumption of business on Friday morning the various reports were first dealt with. The directors' report on the motion of J. E. Farrell was turned over to the Resolution Committee to be reported on at the afternoon session. Upon being brought up a second time, several points came up for

Provincial Standard Prices.

With regard to a standard price list for the province, the Resolution Committee reported, "That following the motion brought forward by the London Society that a Standard Selling Price List be issued by the Ontario Society and distributed to the entire trade, members and non-members alike, they would suggest that the price list now issued by the Toronto Society would largely meet the need, and that the Ontario Society take means to furnish same as may be required."

The matter was then turned over to come up under new business where judgment was finally given. The question arose as to whether this would interfere with the trade. In this connection, a letter was read from the society's solicitor to the effect that this procedure was quite in line with the character of the society. It was then moved by J. Bloom, seconded by E. H.

Russell, of London, that the recommendation be adopted. The motion was carried.

The question of standardization of ordinances brought up in the directors' report was given some slight discussion. Finally, on the motion of Frank Maxwell, it was decided to hand over the whole question to the incoming Legislation Committee, with whom the Sanitary Committee should also act on this question.

Permanent Headquarters for Society.

On the motion of J. A. Caslake the question brought up in the vice-president's report, namely, the advisability of having a permanent headquarters for the association which would serve for a permanent office for a secretary, and to some small extent for club rooms, was referred to a committee of three.



Lewis Le Grow.

Those appointed to act on the committee were: L. Le Grow, Wm. Mansell and F. R. Maxwell.

Financial Report.

In the absence of the regular auditors, J. A. Caslake, W. A. Spalding and J. Barnes were appointed by the chair to look over the books for the past year and deal with the secretary-treasurer's report. Everything was found in first class order, and general satisfaction expressed with the finances of the society. The report as submitted by Wm. Mansell showed that there was still \$43.27 on hand.

Report of Directors.

Gentlemen:

It was with a great deal of pleasure and responsibility that we accepted the office of Directors for the past year. We have met regularly every two weeks, and very often have held special meetings. We have viewed our responsibility to you, gentlemen, from the most ex-

haustive viewpoint. Ontario is a large and prosperous province. In its villages, towns and cities are to be found men who are practical and scientific, men who have a policy as to the future and are anxious to see the sanitary profession progressive, and become of some importance to the national life of this country. They recognize that a oneness of purpose in its general application is necessary; That individual peculiarities should not endanger unity of purpose. They believe that, though one may not endorse or approve of peculiar local situations, they at least admit that association with the provincial body would help to overcome local difficulties that appear to want a great deal and are not prepared to unite themselves with others.

We sometimes despair of ever getting some men to unite with our association. They seem to think that your Directors, or some of your members should plead with them in a spirit of humility and tenderness. Some will not join our society because they cannot see any advantage to be derived; others will not join because some are members who they do not think should be; others fear that this society will go the way of all others and in a short time pass away. Others think that \$10 each year is a lot of money for organization purposes.

And now, gentlemen, let us remember that if there are any grounds for these complaints, do these complaints cease to exist because of our attitude? If we do not do the work of Ontario from a sanitary viewpoint, others will rise up and perform it for us. The smaller our viewpoint the smaller our view. The society stands for something more than giving the meanest things it is capable of giving. It stands for the advancement of the Sanitary and Heating profession, and agrees to use its best endeavors to organize the sanitary and heating engineers in the whole province to the end that we may create and foster feelings of fraternity and social intercourse amongst members of the craft, and in addition, the promotion of the following special objects:

The advancement of the trade in its sanitary, heating, commercial, mechanical and scientific departments. Also for its protection against imposition, injustice or encroachment upon its common rights and interests, and for the dissemination among the public of a true knowledge of sanitary science and principles.

Why be a member?

- 1st. For the fellowship and co-operation that you will experience.
- 2nd. For the broad visioned business intelligence that will come to you.
- 3rd. For the friends you will gain.
- 4th. For the satisfaction of that spirit

of progress which is yours and which is a measure of your ability. 5th. For the duty you owe to the province in which you live.

What some members say when non-members should be associated with us.

Some of us say for better financial returns: others for the better to dig out all weeds of poor pay. Others for the social consideration and advancement that come to men of like occupation. Others for the educational advantages. Others declare for self-preservation. And an element of truth is contained in all those and many others, but the fundamental basis of organized professions should be the concentration of energy; the centralization of personality, the fusing of knowledge, the thought that our relationship to the public is of supreme importance; that we should lead in sanitary construction and supply information. The main thought should be the advancement of a standard of comfort, and opposition to impure conditions; the installation of the best class of material and the training of men who will grasp the significance of their calling, and who will show that better work can be done by association with others than by living to themselves.

Some questions that are continually arising, and to which we ask your consideration:

Would it be for the best interests of the profession to have uniform regulations? Your directors believe it would. We believe that inspection and a higher standard of efficiency is as necessary for the town as for the city. That the enactment of uniform regulations to govern all parts of the Province would be a progressive step, and that the Legislative Sanitary Committee should procure all information obtainable from the different municipalities and forward the same to your Board of Directors, and when sufficient information has been secured, that the officers approach the Government with definite facts to back them up in their request.

We are pleased to report that the question of standardizing ordinances is being developed by our Western men, and information is being procured with a view of holding a Convention Meeting in Winnipeg, and we must recognize this as being of prime importance to the future progress of our craft, and we would recommend that wherever possible our members should work in conjunction with Medical Officers of Health. Sanitary Inspectors, Sanitary Engineers and any person who is interested in sanitary science, so that speedy and decisive action may be the result.

The Question of Standard Prices.
Are they needed?

Your Directors are very much impressed with the fact that we need a

standard of prices, and that this Society should issue a re-sale price book in loose leaf form, that these re-sale prices should be made to meet local conditions. We believe that standard prices are bound to come, and we must awaken up to the realization of this. These are matters which can be accomplished through the Association which could never be attained by the individual, and the man that sees what schemes will be of value to him is the man who is going to make a success of his business, and the Association which works together for the benefit of its members is the association which will hold together and accomplish things.

Truly the sanitarians owe the people of this country past due sanitary education. To what extent are we responsible for crime, sin, disease, alcoholic excess, physical decay, impure air and



Wm. Mansell.

unwholesome surroundings? Are we being a party to cheapness and rush? Do we tie ourselves up with unprincipled men who would give to tenants and others anything but the best, who would have us do work that we know is not healthful, but from a desire to stand in and make temporary money we accept the bait when it should be our privilege to explain to this man (who is very often ignorant of sanitary construction) the advantages of good material and good work, and of the satisfaction that should come to him by having his work properly done.

L. LeGrow, President.

Vice-President's Address.

The Domestic Sanitary and Heating Engineers.

Gentlemen:—

I have for a long time been thinking and along with other engineers discussing the advisability of having a permanent headquarters for The Domestic Sanitary and Heating Engineers. Al-

most every recognized body of prominent men have permanent headquarters. We have Political, Art, Printers, Social, Engineers Clubs, etc. These clubs are used for many purposes, some socially and others business headquarters. We could use ours for both business and pleasure. Our intentions are to have a permanent secretary and this means office and all other expenses that goes along with it, so why not rent this from ourselves. We could also have bachelor quarters for out of town members when visiting the city, you all know how much better this would be than going to hotels, with the additional advantage of meeting men in your own line of business which would be a great benefit to us all. We would also be sure of having a permanent post office address, which we are not sure of having in the city to-day. There are many other advantages which I will not take up your time going into, other than to say how we could arrange same. I would appoint a Holding Committee or something similar and for them to secure some suitable building. I do not mean anything like a National Club at the present time. We could improve it at some future time. I think that it would be advisable to secure the property now as you know that values are increasing every day and we could not make any mistake even if we did not go through with the project. We could issue shares from \$10 up to a certain limit, etc., which could be settled later. I do not think that there is any question about making it pay. I am only speaking for myself as I have not consulted the Toronto Society. They have to have a meeting place and why not us. They could pay part of Secretary's expenses. The apartments would also help out. It would like to see this thoroughly discussed by all delegates as I believe something should be done and at once. Wishing the delegates and Society every success.

Yours very truly,
F. R. Maxwell.

Financial Report.

In this financial statement it is my pleasing duty to be able to report a surplus or a balance in the bank of \$43.27, out of which is owing a secretary's salary of about \$70.00 up to date, and obligations contracted for this convention of another seventy-five or eighty dollars, or upwards of \$150, which we hope to clear off with the payments on the special assessment levied by your directors during the past years on each member, this was found necessary in October last if we were to continue a paid secretary and satisfactorily carry out successfully the business of our Society, with more money at their disposal your Directors could have probably

more in the organization line than has been accomplished, but I am sure every one of us must feel pleased at the report of our corresponding secretary in this line of progress. It is very gratifying to your directors to see their ideal mature, and to know that with one or two exceptions we have planted the seed of our Society in every city in our province. There is yet lots of hard work to do and it behooves each one of us to keep our shoulders to the wheels of the Ontario Society of Domestic Sanitary and Heating Engineers, and push it forward to the position of eminence and to enjoy the esteem of our fellow citizens in place of their slurs and jibes which has been our lot.

Respectfully yours,
Wm. Mansell.

To Have Permanent Paid Secretary.

One of the most interesting discussions during the convention was that with regard to the advisability of having a paid and permanent secretary and to the means of providing for same.

G. F. Frankland, who has been acting as secretary during the past year was asked to outline the work accomplished during the year. Briefly he pointed out that the membership had shown an increase from 105 to 178 and that before very long he expected to see this advanced to 200. That he had not only kept in constant touch with the members of the association, but was continually urging outsiders to join through letters dealing with various reports and questions up before the association for discussion. At the last sending out of letters he had increased his mailing list to 450 and this continual contact he expected to yield further results shortly.

H. White, of Brantford, bore testimony to Secretary Frankland's statement with regard to keeping in touch with outsiders and stated that it was through these very efforts that he himself had been brought into the society. Mr. White further expressed the opinion that a paid secretary was an investment in the best interests of the society and he was of the opinion that even better results could be obtained through securing a permanent secretary who would devote all his time and energies to the advancement of the society's interests.

F. R. Maxwell pointed out that to ask any member of the society to carry on the work of secretary was an injustice as in doing so it would be necessary either to rob himself through neglecting his business or to neglect the work of the society through not having enough time to devote to its interests. He further stated that the society had now reached a point where a paid and permanent secretary was practically a

necessity and that although the paying of such an officer might cause a little sacrifice at first on the part of the members, still he believed that results derived would fully justify such a movement as well as making future expenses lighter for the individual member.

H. Mahoney agreed with Mr. Maxwell in this, and further suggested that as the Toronto society was now growing to be a large body the secretary could also be employed to do much local work. Thus, through the Toronto society paying a part of the expense it would be an easier matter to provide for a permanent officer.

Meeting Expenses of Secretary.

With regard to payment for secretary the Committee of Ways and Means reported as follows:

After due consideration, your committee beg to report that the amount of



Harry Hicks.

\$2,000 is necessary to secure a proper person to do the necessary work and interest each member of our association in our society's requirements, and hereby suggest that the convention take into their serious consideration the advisability of increasing the annual assessment to at least \$10 per member.

W. Mansell, Chairman.

After much discussion it was decided that as an annual fee of \$10 per member could not then be collected, the secretary should collect \$5 per member as in previous years, and that a further assessment of \$5 per member be made by directors.

This was heartily concurred in by all present, general opinion being that a permanent secretary should be provided at any cost, the society now having reached a point when they could no longer afford to be without one.

On the motion of B. Noble, seconded by F. J. Minnes, the incoming directors were given full power to select and appoint to the office whom they should find fit.

Issuing of Permanent Certificates.

F. R. Maxwell introduced the question of issuing a certificate good for all years instead of for only one year as at present. He recommended that the reading be changed from "issued for the year 1913," to "issued in the year 1913," other reading remaining unchanged. All certificates as issued at present he urged should be withdrawn. The change met with favor and motion to that effect put through.

This, it was pointed out, is one more step preparatory to introducing a system of examinations which every sanitary and heating engineer would be required to pass before being allowed membership in the association.

In connection with this the question was brought up as to whether two certificates would be issued to one man having two shops, or whether the one certificate would be required to serve for both. General opinion favored the issuing of only one certificate so that the question was not entertained.

Constitution Remains Unchanged.

E. H. Russell, as chairman of the Resolution Committee, brought in the following notice of motion: "To amend clause 34 of the Constitution and By-Laws as follows: To strike out the word 'ten' in the second line of section 34 and substitute the word 'five.'" Clause 34 deals with the number of members required before a local committee can be formed.

F. R. Maxwell moved, and was seconded by R. J. Sturgeon, that clause 34 remain unchanged as a local committee of only five might tend to jeopardize the society rather than strengthen it.

The motion was carried.

One Dollar to National Thought Enough.

Secretary Frankland read a letter received from Jas. Marr, secretary of the National Association, stating that the expenses of the National Society had been especially heavy and asking that each member of the Ontario Society give \$3 in place of \$1 as heretofore.

F. R. Maxwell thought that \$1 per capita was plenty considering all the benefits derived from membership in the National. The agreement, he stated, was to affiliate at per capita \$1, and up to the present time no notification had been received refusing these terms.

J. A. Caslake was of the same opinion and moved "that the secretary notify the secretary of the National Association that we will not affiliate with them unless according to previous conditions calling for per capita tax of one dollar."

The motion was seconded by T. E. Henry and carried unanimously.

Delegates to National.

The question of appointing delegates to the convention of the National body to be held in Montreal in June was then brought up. Provided the terms stated above were accepted, the following were appointed as delegates: H. Mahoney, Guelph; G. F. Frankland, Toronto; J. T. Blyth, Ottawa.

F. R. Maxwell suggested that the delegates, if accepted, be instructed as to what was the desire of the Ontario Society with regard to the National Association.

The recommendation was adopted.

New Heating Specifications.

The report presented by H. G. Waterman, chairman of the Heating Committee, showed careful attention to the best interests of the society. In it, it was pointed out that all questions sent in had been answered in as satisfactory a



J. T. Blyth.

manner as possible. And in this connection earlier in the convention. Mr. Waterman strongly advised that all difficulties in heating should be submitted first to the heating committee for solution, and thus receive information first hand. The committee, he stated, were always glad to give any assistance possible either in the way of information or practical drawings to solve difficulties, and would not confine this offer to the society only but would aid outsiders in the trade just as readily.

In connection with the new heating specifications as framed by the committee, F. R. Maxwell recommended that the clause dealing with quick opening valves be struck out.

On the motion of H. Mahoney the report was received and handed over to a special committee composed of H. G. Waterman, J. E. Farrell, and J. Marshall, to be dealt with, revised, if necessary, and brought again before the meeting. The form of specification as recommended by this committee is given below.

low. Upon the motion of J. Bloom, it was decided to have this form submitted to the society's solicitor, framed in technical terms, and adopted.

Report of the Heating Committee.

To the Ontario Society of Domestic Sanitary and Heating Engineers.

Mr. Chairman:—

The Heating Committee beg to make the following report:

That they have executed all business put before them, and answered all questions and communications from members during the past year, and wish to recommend the adoption by the members of the draft Specification for Hot Water and Steam Heating which they have prepared. The object of these specification forms is to eliminate the use of those supplied by the manufacturers and to put before your client a specification that will bear the heating man's name, and so advertise his business and show him up in his true light. We would not recommend these specifications being got out by this society. But that sufficient draft specifications be procured to forward one to each member of our Society so that each individual may have his specifications either printed or type-written with his own heading.

Guaranteeing Heating Work.

We would strongly discourage the practice of guaranteeing jobs laid out by salesmen and others. This is a practice that will cause any of us a heap of trouble and loss of money at some time or other, unless we thoroughly go into the specifications for ourselves and satisfy ourselves that the boiler and radiation is sufficient for the building to be heated at temperature desired.

We would further discourage the practice of agreeing and specifying to paint the pipes and radiators, as this work does not belong to us and is a source of constant trouble.

We would further recommend to this Society that the standardizing of residence heating be looked into, so that people purchasing houses with a so-called hot water heating system in them would be able to discriminate between a job installed by a competent firm and a job put in for price only regardless of its utility.

Specifications of Hot Water Heating System.

GENERAL.—The system to be..... hot water heating and to be installed in the most complete and up-to-date manner. All materials used to be the best of their respective kinds. The system to be thoroughly tested and left in good working order.

BOILER.—Furnish and erect..... Boiler supplied with flue brush, scraper and poker and having a net rating of..... square feet.

FOUNDATION.—A suitable foundation on which to set boiler is to be provided by owner.

PIPING.—All piping to be of the best quality and to be run at a proper elevation and to be proper size to ensure quick and even distribution of the water to the various radiators.

FITTINGS.—All fittings to be of the best quality grey iron casting, heavy pattern, full thread and free from all defects.

HANGERS.—All flow and return pipes in basement to be properly supported and secured to ceiling by neat iron hangers.

FEED AND DRAW

OFF VALVES.—The supply and draw off connections to be fitted with suitable valve or cock, for the purpose of filling and emptying the system at any time. Supply valve is to be placed at most convenient point.

FLOOR AND

CEILING PLATES.—Above basements protect with floor and ceiling plates at all points the openings where



J. Marshall.

pipes pass through the floors, walls and partitions.

EXPANSION TANK.—A heavy galvanized iron expansion tank equipped with gauge glass and brass mountings is to be installed above the highest point of circulation in the system and equipped with 1 inch pipe to the atmosphere. A 1/2-in. relief pipe to be taken off just above the expansion tank and carried to a closet tank or to the basement.

COVERING.—Cover all exposed mains and branches in basement with

SMOKE PIPE.—The boiler to be connected to the flue in basement by heavy iron pipe (fitted with damper) of the same size as collar on boiler. A flue of sufficient size and height to be provided by owner, and no other opening to be permitted in same flue.

RADIATOR VALVES

AND AIR VENTS.—Each radiator to be supplied with a radiator valve of proper size, and air vent.

RADIATORS.—The radiators used to be of standard make according to attached schedule.

MASON AND

CARPENTER WORK.—All necessary mason and carpenter work required to be provided by owner.

TEMPORARY USE.—Should owner, or his agents, contractors, or other acting under him, or them, desire to use any part of this apparatus prior to its acceptance, permission is hereby granted under the following conditions: That the apparatus is to be operated entirely at owner's risk and expense and delivered to heating contractor again in good condition as found. If temporary radiators are required an extra charge of \$..... will be made for each radiator connected.

DAMAGE.—Should any part of heating contractor's work or material in this system be damaged, it shall be made good by the owner.

ACCEPTANCE.—I..... hereby accept the proposition of to install the work as specified above for the sum of \$..... payable as follows, one-third when roughing in is done, one-third when boiler and radiators are on the ground, the balance payable within twenty days after the completion of this contract. All rights, title and interest in the boilers, radiators, pipes, fittings, valves, etc., remain vested in this heating contractor until all payments have been made.

Specification for Steam Heating.

GENERAL.—The system to be a..... a good workman like and to be installed in a manner all materials to be the best of their respective kind.

BOILERS.—To be a and to be provided with the following trimmings: one cast iron water column, complete with gauge with glass water gauge and trycocks; one low pressure steam gauge; one low pressure safety valve, and one set of cleaning tools, consisting of brush, scraper and poker.

PIPING.—All piping to be of the best quality and to be run with proper fall so that water of condensation will return freely to the boiler.

FITTINGS.—All fittings to be of the best quality of gray iron casting, heavy pattern and full thread. All flow and return pipes in basement to be properly supported and secured to ceiling by means of suitable hangers.

BLOW OFF.—From lowest point of system run blow off pipe fitted with stopcock or valve.

WATER SUPPLY.—From nearest suitable water supply run a inch iron supply pipe to boiler fitted with valve swinging check valve.

FLOWER AND

CEILING PLATES.—Above basement protect with flower and ceiling plates at all points the openings where pipes pass through the floors, ceilings, or partitions.

COVERING.—Cover all exposed mains and branches in basement with....

.....
The boiler to be covered with.....

SMOKE PIPE.—The boiler to be connected to the flue in basement by a heavy iron pipe fitted with damper of the same size as the collar on boiler.

CHIMNEY.—A chimney of proper size and of sufficient height to be provided by owner, and no other openings permitted in same.

FOUNDATION.—A suitable foundation to set boiler upon to be provided by owner.

RADIATOR AND

AIR VALVES.—Each radiator to be supplied with a radiator valve and a air valve.

RADIATORS.—The radiators used to be of standard make according to attached schedule.

MASON AND

CARPENTER WORK.—All necessary mason and carpenter work required to be done by owner, including bricking in boiler if required.

For temporary use, damage, and acceptance, see hot water heating specification above.

Report of the Sanitary Committee.

Mr. President and Fellow Sanitary and Heating Engineers.

I beg to submit the following report pertaining to my office as Chairman of the Sanitary Committee:

This has been a most unusual year in the history of the firm I represent, and also the work and programme I laid out superintendence end of our staff, and I found it almost impossible to secure qualified mechanics to fulfill this end of the work.

It seems to me that the journeymen are not giving sufficient attention to their trade, therefore, when they are called on to superintend the installation of their work, they have not the sufficient knowledge, and therefore, fall short. This I think should be looked into by our apprenticeship committee, and some measure taken up so that the apprentice must serve his proper term, and turned out a proper mechanic before receiving his journeyman's papers. I think it would be a profitable measure

for the Journeyman's Union to have an examination board and before an applicant could become a member he would have to pass the examination and satisfy the board that he was a qualified mechanic. This board could be composed of masters, journeymen, and one of the inspectors. If this measure were adopted, I believe that we would have better mechanics and also raise the standard of our craft and bring us to the position that we should occupy.

Our calling is not merely a trade, but a profession, because we are guardians of the health of our people. We play a most important part in Life's game, for if we did not have proper sanitary appliances we would not have the healthiest race of people in the world to-day. Therefore, it behooves every one of us to study and strive to grasp and conquer all the most improved methods in our profession. We should know our calling thoroughly so that the people should look up to us rather than what they are doing to-day.

I intend, if possible, to get together all the Medical Health Officers and prominent Sanitary Engineers and Inspectors, of Ontario in convention, draw up a code of laws that will be applicable to all towns and cities in the province, and also the advisability of state and municipal inspection, also a state examination board for Masters and a Municipal board for journeymen. The examination for journeymen I propose to adopt, is to have an examination twice a year.

Our Society being a professional one on sanitary matters and recognized by the state as such, by granting us a charter. We should not allow anyone to practice without first securing a certificate from the state examination board that he is qualified to do so. I think this is a very important point and I will do all I can to get the measure through.

The reason that I have not appointed other members on my committee is that I believe that the chairman should have at least two members of his committee in his own town so that they could get together and discuss and settle questions that would be practically impossible to settle by correspondence. Our city is not organized as yet, although we hope to organize in the near future, as some other members of the craft are present at this meeting, which we hope to welcome into our fold.

Thanking you for your kind attention and trusting that you will receive this report.

R. G. Sturgeon,
Chairman.

The following is a form of the letter sent to the various district medical health officers:—

Dear Sir:—

Having been elected chairman of the Sanitary Committee of the Ontario Society Domestic Sanitary and Heating Engineers, it is our intention to endeavor to improve the sanitary conditions of the province. With your co-operation we can do so.

If you have a plumbing by-law, we would be pleased to receive a copy of the same, if not, do you wish to have one? In that case we would lend our assistance in framing a plumbing code for your city.

It is the intention of our society to endeavor to standardize a plumbing code for Ontario. We would like to have your views on same, also on all matters pertaining to Plumbing and to Sewage Disposal.

It is our intention to hold a convention of the Medical Health Officers and Sanitary Engineers, at an early date. At the convention we will take up the vital question of the pollution of streams and rivers and also the proper treatment of sewage.

We wish to impress on you the necessity of a prompt answer, as we cannot commence our campaign for the better health of the province too soon.

Yours respectfully,

R. G. Sturgeon,

Chairman Sanitary Committee.

On the motion of W. Brittain, the report was accepted, and the suggestion made that the letter also be sent to the various district officers appointed by the Association.

Report of the Apprenticeship Committee

To the officers and members of the Ontario Society of Domestic Sanitary and Heating Engineers:

Gentlemen:—

The Committee on Apprenticeship begs to recommend that this society adopt at this meeting the form of indenture for apprentices as follows:.... and that a copy of this indenture be mailed to every member of this association.

W. Brittain,

Chairman.

Hours of labor and salary payable inserted below are not binding, and can be changed to meet local conditions.

Form of Apprentice Indenture.

THIS AGREEMENT made this....day of....., 1913.

BETWEEN:—

Employer, carrying on business as Domestic Sanitary and Heating Engineers, in the City of in the Province of Ontario. of the First Part.and apprentice, a son of the said..... and the said both of the

City of, hereinafter called the Apprentice, of the Second Part.

.....and..... Parent or Guardian, of the said City ofhereinafter called the Party of the Third Part.

WITNESSED that the said party of the Second Part with consent of his parents or guardian puts, places and binds himself as an apprentice to the said party of the First Part to learn the trade or business of Plumbing or Steamfitting, for the term of Five (5) years commencing on the..... day of..... one thousand nine hundred and thirteen.



J. E. Farrell.

during the whole of this said term the said apprentice shall attend on all working days at the place of business of his said master, Blank & Co., from the hour of eight o'clock in the forenoon till the hour of six o'clock in the evening, with the exceptions of one hour for dinner. And the said apprentice shall cheerfully obey the commands of his said master, his secrets keep, his property protect, his interests by every means in his power promote, and prevent his master's property from being purloined, made away with or damaged by others. The said apprentice shall not lend the goods of his said master nor remove any portion of them from the premises of the said master without his authority or consent. The said apprentice shall not frequent taverns, saloons or places of gambling nor absent himself from the service of his master during working hours at any time without leave first obtained for that purpose, but shall demean himself towards his said master as a good apprentice ought to do.

In consideration Whereof Be It Said the said Blank & Co. Domestic and

Sanitary Heating Engineers of the City of, the party hereto of the First Part do hereby covenant, promise, and agree to and with the party hereto of the Second Part or his Executors and Administrators that he will teach and instruct or cause to be taught and instructed in the trade or business of Plumbing and Steamfitting and will also pay unto the said party hereto of the Second Part or to whom he may appoint to receive same for the services of the said apprentice the several sums following, that is to say, for the first year of the said term the sum of Fifteen (\$15) Dollars per month with a bonus of Sixty (\$60) Dollars at the end of the first year. Second year the sum of Twenty (\$20) Dollars per month with a bonus of Sixty (\$60) Dollars at the end of the second year. Third year, the sum of Thirty (\$30) Dollars per month with a bonus of Sixty (\$60) Dollars at the end of the third year. Fourth year, the sum of (\$40) Dollars per month with a bonus of Sixty (\$60) Dollars at the end of the fourth year. Fifth year, the sum of Sixty (\$60) Dollars per month with a bonus of Sixty (\$60) Dollars at the end of the fifth year.

Bonus money shall be placed into a chartered bank and held in trust until apprentice has completed his five years as per the agreement between his master. This money shall be paid into a joint account in the name of the apprentice, the apprentice's master, the apprentice's parents or guardian and shall be paid in instalments of Thirty (\$30) Dollars every six months.

Should the apprentice fail to comply with his agreement or fail to fulfill same, this bonus shall then revert back to his master or should the apprentice die during his apprenticeship, the money then shall revert to his parents or guardian and should he complete his apprenticeship agreement and become a journeyman plumber or steamfitter, the money then shall revert to him at the expiration of the five years along with interest on same.

The master also agrees to furnish the apprentice on the expiration of his five years with a complete kit of plumbing or steamfitting tools as required by schedule arranged between Masters and Journeymen Plumbers or Steamfitters.

The apprentice shall be required to serve six months on probation, when the said Master shall take entire control of the said applicant and if satisfactory on all sides, he shall further sign for a period of four years and six months, which will constitute his five years. The master to be the sole arbitrator on his ability to learn the Plumbing or Steamfitting.

Should a grievance arise between Master and Apprentice, during his term

of apprenticeship, in which the Apprentice considers he is not being fairly dealt with, the matter may be referred to an arbitrating committee, composed of three, the master, the Apprentice's parents or guardian, the third to be mutually agreed upon by the above two and whatever decision is arrived at, to be final and binding.

And the said party hereto to the Third Part hereby for himself and his executors and administrators covenants, promises and agrees to and with the said party of the Third Part his executors and administrators that he will, during the whole term of five years find and provide, or cause to be found and provided, for the said apprentice good, proper and sufficient board, lodging, washing, medical attendance, suitable clothing and all other actual necessities and will do all and perform to the utmost of his power every act and thing which may aid and assist and complete the said apprentice to perform his duties diligently and faithfully during the whole of the said term.

And for the sure and full performance of all and every the foregoing stipulation and agreement each of the said party hereto of the First, and Second and Third Part respectively covenants and agrees and binds himself and themselves severally to the other and the others of them, it being, however, distinctly understood and agreed between parties that the death of the same master shall annul this agreement as though the same had become void by effect of time.

That if the apprentice shall, at any time during the said term, be wilfully disobedient to the lawful orders or commands of the master, or be slothful or negligent, or shall grossly misbehave himself towards the master or his family, then, and in any such case, the master may discharge the apprentice from his service.

IN WITNESS WHEREOF, all the said parties hereto have hereunto set their hands and seals, the day and the year first above written.

SIGNED, SEALED, and DELIVERED,
in the presence of

In discussing the form of indenture, F. R. Maxwell stated that five years was, in many cases, too long to tie a boy down for apprenticeship and suggested that a man be freed from his agreement as soon as he became sufficiently proficient.

In this connection, J. R. Haslett gave his experience with an indentured apprentice and pointed out that it had been altogether unsatisfactory.

Further discussion was postponed to the next annual meeting. In the mean-

time copies of the indenture form are to be secured and sent to every member of the society for consideration.

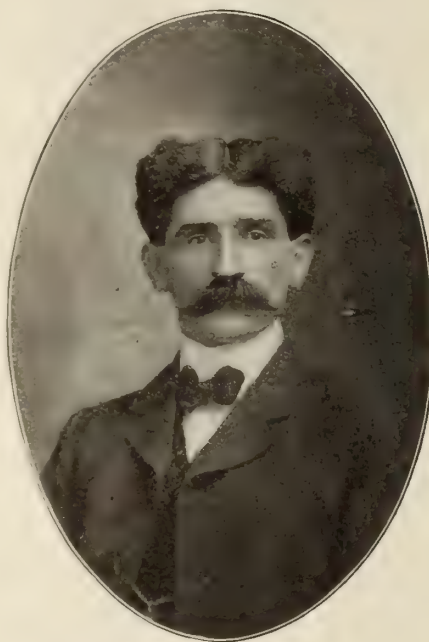
Report of Educational Committee.

To the Third Annual Meeting of the Ontario Society of Domestic Sanitary and Heating Engineers:

The education pertaining to our profession which is all important and too much stress cannot be laid upon its necessity.

However as chairman of your Educational Committee I have failed to accomplish anything that will be of real value to the members other than the offering of the few suggestions contained in this report.

It seems to me that the masters should take more personal interest in the education of the boys which have



Harry Mahoney.

commenced the practice of our profession. This might be done by kindly talks and giving them technical books on Sanitary Science, Heating and Ventilating. After the first year give them a few tools; after the second year give them a few more tools and a small tool box; in the third year a complete set of tools. This will serve greatly to keep up the boys interest, in addition, get them to take up drawing, etc., and above all, place them with the kindly, best and most intelligent journeymen.

For the immediate future, I believe our members should individually and collectively endeavor to have manual and technical training introduced in all our public and high schools and follow that up by having Sanitary, Heating and Ventilating Engineering made a feature of that education. The results

would be that a greater number of young men would become interested in the profession and for them that did not take it up as a vocation, would have gained sufficient practical knowledge to demand a higher class of life, while society as a whole will benefit from the higher standard of systems installed, all of which will redound to the prestige of the Sanitary and Heating Engineers.

To accomplish this, our members must begin an active campaign in their different communities through the Boards of Education, the Boards of Trade, particularly the Industrial Committees, of the latter.

Respectfully Submitted,
J. E. Farrell,

Chairman Educational Committee.

Report of Examination Committee.

To the Ontario Society of Domestic, Sanitary, and Heating Engineers:
Mr. Chairman and Gentlemen:—

In presenting this examination committee's report to you, let me first crave your indulgence for any errors or omissions that may appear, as we consider it no light task to prepare a set of questions and answers that will be satisfactory to all, but one thing we will say, that no time has been spared in working out the questions and answers for this examination paper. We have compiled in all 86 questions and answers covering the various subjects pertaining to our craft from the practical end, including a few questions regarding the business end. The latter questions I might add here, were only thought of at the last moment before compiling this report, consequently the questions are few, but we think, they are well placed and are of vital importance, especially to the younger men starting out in business, and desirous of joining our organization. They have an educational value that cannot be overlooked, and without doubt, before answering the questions asked regarding the operation of our business, they will cause anyone who is being examined to think a great deal, and perhaps it will open up a new phase on the business end that has not been thought of by them. We would recommend to the incoming examination committee, that the questions pertaining to the business principles that we have lightly touched upon, be enlarged and elaborated, so that the educational value of our examination papers will be greatly enhanced. We have not compiled any highly technical questions but confined ourselves to those only, that any practical man may be able to answer intelligently. These with the chart test, your committee deem sufficient to serve the ends of this society.

All of which is respectfully submitted.

J. MARSHALL,
Chairman.

Report of the Arbitration Committee.

To the officers and members of the Ontario Society of Domestic, Sanitary and Heating Engineers:

Gentlemen:—

As chairman of the arbitration committee, it is with the greatest pleasure that I am able to report to you, that the work of the society has been so satisfactory that it has not been necessary to call a meeting during the year. We sincerely trust it will always remain as such.

Respectfully yours,

J. A. CASLAKE,
Chairman.

Report of the Legislation Committee.

To the officers and members of the Ontario Society of Domestic, Sanitary and Heating Engineers:

Gentlemen:—

Your legislation committee beg leave to present this short report. Nothing having been reported to the committee during the past year we had practically no work to do. We believe in the best interests of the society that the legislation committee should be located in the same place as the Board of Directors.

We would recommend that this society ask the Provincial Board of Health to suggest to the Local Boards of Health that a master plumber, where possible, be made a member of the Local Boards.

Respectfully submitted,

HARRY MAHONEY,
Chairman.

Technical Education and the Trade.

After the reports had been received from the various committees, Jas. R. Haslett, of London, presented an excellent paper on Technical Education as pertaining to plumbing and heating. Mr. Haslett is one of the instructors in the London Technical School, and drew his observations from his own experience both in the school and in the trade. His paper in full is to be found elsewhere in this issue.

On the motion of J. Bloom and T. Smythe, a hearty vote of thanks was extended to Mr. Haslett for having presented such a masterful paper and the secretary was instructed to have copies made and sent to every member of the society.

Selling Outside the Trade.

From time to time throughout the convention the question of the manufacturers and supply houses selling to men outside the trade was brought up. Discussion was of a very varied nature and waxed quite warm at times. Port Arthur, Fort William, North Bay, Collingwood and Brantford reported little trouble in this regard and offered various

suggestions as to the most forcible means of preventing the practice. In the opinion of those who most emphatically laid the complaint that the manufacturers and jobbers were not satisfied with acting in that capacity alone, but wished to be retailers and even installing engineers as well, the towns mentioned above were each blessed with being surrounded by a "little Heaven." Though much discussion ensued, little definite business was accomplished and the question was turned over to a committee of five who should make thorough investigation, notify each member three months before next annual meeting as to their progress, and bring up the question at the next convention.

Considerable indignation was expressed also at the action of the supply houses in supplying plans and specifications, and even figuring on a job for the man who was incapable of doing this himself but who was willing enough to install their material and accept their aid allowing them to figure his margin on the job.

The adoption of a definite heating specification as mentioned above was one step taken to eradicate this evil. A definite system of licensing through examination was also considered helpful. Action along this line has already been dealt with.

Dealing With Bulk Tenders.

In the opening meeting on Thursday afternoon, J. McKinley, of Ottawa, introduced the question of bulk tenders and asked for an expression of opinion as to what treatment was received on such tenders in the Western part of Ontario.

R. G. Sturgeon, of Peterborough, stated that where he had to take a sub-contract he found much trouble arising. For his own part he liked to deal with the owner direct on account of receiving better satisfaction. He suggested that in dealing with a bulk contract, it should be stated in the specification that payment should be made on receipt of a certificate from the architect instead of withholding 15 to 25 per cent. of the price of the job.

Geo. Clapperton spoke of the difficulty of arriving at a policy to deal with all general contractors, but stated that the experiences from a number of cities should give a definite idea to work upon.

B. Noble, of London, stated that in London not so much difficulty was found in getting the money as with the contractor getting a figure on a job and then peddling the contract.

For this T. J. Minnes, of Brantford, stated that the solution lay in the trade getting together, arousing better feeling and greater confidence amongst the various members and in the members working conjointly. All the big contracts,

be stated, went to responsible men. These men were in the association. And if these should get together, arrange the job between them and together figure on prices, he thought the whole difficulty would be removed.

Figuring on Jobs in Outside Towns.

In connection with communications received by the society the point came up as to whether a sanitary and heating engineer should travel the country, figuring on installations in towns where there were brother members of the society. F. R. Maxwell took the stand that all members should refuse to, and refrain from figuring on work in such towns until they had first consulted the members in those towns. E. H. Russell bore out Mr. Maxwell in his recommendation stating how conditions were met in London.

The recommendation was carried.

Form an Endowment Fund.

The resolution committee brought in the recommendation of the London Society as follows: "That a form of bequest be appended to the constitution and by-laws for the purpose of forming an endowment fund," and in connection brought in a form of bequest.

At first the aim of the resolution was not grasped, and some hesitation was noted. But when the worthy president explained that it was simply a form to allow any member to bequeath \$500, more or less, to the funds of the society, the motion was unanimously carried.

Election of Officers.

Last in the order of business came the election of officers for the coming year. In announcing this order of business president LeGrow pointed out the necessity of introducing new blood into the society and thus keeping up the activity of the association. In the Toronto society, he stated, this had been proved to work to great advantage. Upon the election of some of the younger members to office the fear had been expressed that they would prove incapable through inexperience. On the contrary new life had been given the society and he strongly advocated the election of a new set of officers throughout. He pointed out that in every movement there was great danger of a reaction setting in, and that now this society was sufficiently established to allow the old officers to step out and hand over the reins to the younger members who with greater energy should cause even greater success than had been attained in the past. Referring to the question of selection he asked that he be allowed to retire, and that he be not considered as candidate for office for another year.

On the request of the president, Mr. Mahoney took the chair and discussion continued.

Mr. Maxwell referred to the fact that his office during the past year had caused a tremendous amount of work to fall on his shoulders, and this greatly adds to loss of his own business. While he had done all gladly and had been willing to sacrifice his time for the association, still he asked that he be relieved from office during the coming year.

Mr. Mansell, though absent, sent in the same request through Mr. Mansell.

Expression of appreciation of the work of the directors was made by H. Mahoney, E. H. Russell, J. R. Haslett, and others. R. J. Sturgeon, seconded by W. Brittain, moved a vote of thanks to the retiring officers for the capable and unselfish way in which they had conducted the affairs of the association during the past year.

The nominating committee composed of H. Mahoney, B. Noble, W. Brittain, G. Clapperton, and H. Hicks, then brought in their report recommending the re-election of Messrs. LeGrow, Maxwell and Mansell for board of directors for 1913.

To this both Mr. LeGrow and Mr. Maxwell strenuously objected, and open nominations followed, resulting in the nomination of F. R. Maxwell, H. Hicks, and L. LeGrow.

These were asked to withdraw to consider their appointment. While awaiting their decision, open discussion was carried on informally.

On the motion of J. E. Farrell and J. R. Haslett, a vote of thanks was passed to Plumber and Steamfitter for the assistance it had rendered the association and the trade at large.

New Officers Appointed.

On the return of those appointed to office Mr. Mahoney asked J. McKinley and G. Clapperton to escort the new officers to their respective chairs. The announcement that F. R. Maxwell was to occupy the presidential chair, H. Hicks that of the vice-president, and L. LeGrow that of secretary-treasurer was welcomed with hearty handclapping and loud applause, and the new officers were unanimously elected.

Chairman Elected.

Following out the report of the nomination committee, the same chairmen were asked to act for another year with the exception that J. T. Blyth, of Ottawa, was appointed as chairman of the legislation committee.

The chairmen as elected then are as follows:—

Sanitary—R. J. Sturgeon, Peterboro'.
Heating—H. G. Waterman, Toronto.
Arbitration—J. A. Caslake, Collingwood.

Legislation—J. T. Blyth, Ottawa.
Apprenticeship—W. Brittain, Hamil-

Educational—J. E. Farrell, North Bay.

Examination—J. Marshall, Port Arthur.

Votes of Thanks.

E. H. Russell, on behalf of the London society moved a vote of thanks to J. T. Aggett and Wm. Mansell for the papers which they had presented before the Toronto society and which were published in full in Plumber and Steamfitter. These Mr. Russell stated, were particularly valuable and showed great research work. The motion was seconded by H. Mahoney, of Guelph, and carried unanimously.

On the motion of E. H. Russell and H. Mahoney, a hearty vote of thanks was extended to Purdy, Mansell, Ltd., of Toronto, for having given the association the free use of their office, heat, and light during the past year.

As this concluded the business of the convention an adjournment was reached.



MEMBERS IN ATTENDANCE.

Those present at the convention were J. Hainsworth, Berlin; V. Israel, Berlin; W. A. Spalding, Preston; L. Gies, Dundas; A. S. Bates, Bracebridge; J. Murphy, New Liskeard, Harry Mahoney, Geo. E. B. Gringer, Fred Smith, Andy Malcolm, Guelph; I. J. Ross, Galt; J. Marshall, J. Barnes, Port Arthur; H. White, T. J. Minnes, T. A. Cowan, J. Anguish, S. Whitfield, Brantford; W. J. Boyce, Wingham; J. T. Blyth, J. McKinley, Ottawa; E. H. Russell, J. R. Haslett, J. Eggett, C. F. Needham, B. Noble, Ed. Holland, W. Skelly, A. E. Gibbons, London; Geo. Ross, H. S. Brown, Brockville; J. A. Caslake, Collingwood; R. G. Sturgeon, P. Thompson (Inspector), Peterboro; W. Brittain, J. Bloom, D. Robinson, Hamilton; Frank Rudowe, Elmira; C. H. Hoople, St. Catharines; J. E. Farrell, North Bay; Thos. E. Henry, Stratford; A. Joss, W. Goodwin, Sarnia; L. Le Grow, Wm. Mansell, F. R. Maxwell, G. F. Frankland, F. Gentle, T. B. Smythe, F. Maxwell, T. Price, G. Kirtley, H. Ruddick, D. Glynn, E. T. Needham, H. Hicks, J. T. Aggett, T. Ferguson, A. H. Read, G. Clapperton, A. F. Passmore, G. H. Wixon, J. G. Fullerton, H. T. Waterman, C. W. Aldred, Robt. Yeomans, P. J. Hayes, J. Cracknell, F. Kelly, H. Daniels, G. Cooper, H. MacMinns, S. Meridith, R. Hillier, T. Prince, J. Jackson, N. Blumbergh, W. Minns, Toronto.



IRISH NIGHT A BIG SUCCESS.

"Irish Night" of the Toronto Society of Domestic Sanitary and Heating Engineers proved a huge success from an entertaining standpoint, and from the

standpoint of those members of the association living outside Toronto a key to the success of the Toronto locals.

The attendance was a record one, some hundred men sitting round the festive board, and every one a member of the Ontario Association.

After having sat through an afternoon of routine business, the digression to something of a lighter nature was welcome, and the record attendance, the feeling that they had gathered together at the convention as "all for one and one for all," and that all must be Irish at least for one night, lent a very buoyant atmosphere to the gathering.

After having done justice to the various courses, and tipped off with a good cigar, Chairman Pat Hayes called upon H. G. Waterman to welcome the visitors to Toronto on behalf of the Toronto locals.

The main part of the programme was of a musical nature. The Plumbers' Orchestra was there in full force. Archie Melhuish on the trombone acted as leader, and was assisted by R. Flooke, violinist; O. Foote, on the flute; J. Patterson, string bass; and E. Mason, on the coronet.

The services of Roy McKellar, soloist, and Jules Brazill, entertainer, had been employed for the evening, and these, with the orchestra, provided a bag of fun for all.

Speeches of an entirely impromptu nature were given by Harry Mahoney, of Guelph; E. H. Russell, of London; T. J. Minnes, of Brantford; J. A. Caslake, of Collingwood; Ben Noble, of London; and Jack Marshall, of Port Arthur. Wm. Mansell, the pioneer of the association, dealt with the growth of the society from three to present membership, and Frank Maxwell outlined the policy adopted by the Toronto Society in conducting their regular meetings, laying special emphasis on the importance of social gatherings.

Altogether one of the most successful evenings in the history of the society was spent, and general feelings of congratulation and praise were expressed with regard to the entertainment provided by those in charge. These were chiefly P. J. Hayes, Dan Glynn, and J. E. Fullerton.



St. Catharines, Ont.—The journey-men's strike which has been on here for the past few weeks has finally been settled, a scale of wages up till June 1914 having been agreed upon.

Rainy River, Ont.—The partnership of Robt. J. Russell and Sam Sage, sanitary and heating engineers of this town has been dissolved by mutual consent.

Sarnia, Ont.—Fred J. Lawrence has opened a plumbing shop at 132 Cameron St.

Technical Education Helps Plumbing

Jas. R. Haslett Shows How Night Classes in Technical Schools Are a Direct Advantage to Boys Learning the Sanitary and Heating Engineering Profession
—The Old Apprentice System Being Replaced by Technical Schools—Illustrations Taken From Work Carried on in London, Ont.

The following paper on Technical Education as pertaining to Plumbing and Heating was presented before the convention of the Ontario Society of Domestic Sanitary and Heating Engineers, by Jas. R. Haslett, instructor in the Plumbing and Heating Department of the London Technical School:—

One of the surprising things of the present age is the wonderful development of technical schools on this continent during the last half a century. In 1870 there were only two technical colleges, one at Troy, N.Y., the other being the Polytechnic Institute at Philadelphia. Now there are some fifty strictly technical schools on the continent of America in addition to all the colleges of any note having technical departments, which in all number up in the hundreds, and the students may be counted by the thousands.

The length of time required by these colleges to take up a complete course is from six to eight years of a youth's or young man's life, and those six or eight years, it must be remembered, are at a time when progress is most essential. For parents to support a young man during this period, as well as to pay for his tuition, means an enormous outlay, and it remains to be seen whether the end justifies the means. Personally I have my doubts. It would be surprising if these technical institutions did not occasionally produce something out of the ordinary, but let us not forget that many practical shops have turned out shining lights in the various paths of life.

Let us ask ourselves how these technical institutions were brought about in the first place. The sequel of the situation is, in my opinion, that the apprentice system has fallen into history. The lack of discipline in the home has brought about a feeling within our boys that they will not be bound by indentures, that they will not be subservient to anyone, and they are backed up by their parents who in many cases pack off these lads to some institution where there is no so-called drudgery. They expect that in the course of time, these chaps will graduate; and, wearing boiled shirts and stand-up collars, they will be pitch-forked into positions as superintendents and lord it over practical people who have gained experience by good hard knocks and close observation.

It has been said that "Knowledge is Power," but we must not lose sight of the fact that it is not power if its possessor does not know how to apply it.

Up to the present we have noted the startling growth of technical institutions, but we are very much interested in something else, and that is, "Have they helped our own business of Sanitary and Heating Engineering? Is it as easy to get competent men now as it was twenty-five years ago? Do our employees possess as broad a knowledge of things appertaining to our business in general at the present time as they did a quarter of a century ago?" My answer is emphatically no. And further, I venture to state that it was never harder to get practical help than it is at present, and that the standard of excellence in skill is disgracefully low as a general thing. This is the result of the absence of the apprentice system. It looks very plain to me that the good old apprentice system did more for the making of tradesmen than any technical school can ever hope to do. But the apprentice system is gone and the technical school is not filling our needs.

But time moves on and great changes are brought about, and probably in no line of business have greater changes taken place than in our own profession: so we must be up and doing and provide some means to cope with the situation and provide the future with competent tradesmen.

There is one requisite that every applicant to start this business should possess, and that is a good common school education. This asset is absolutely necessary and if employers would insist on this when selecting beginners it would obviate a lot of subsequent disappointment both on the part of the employer and employee. Ours is a business that requires a good fund of common sense combined with considerable genius. Conditions vary in almost every job. Various principles are involved. These must be thoroughly understood by the workman and he must have the power to apply these principles to the varying conditions with which he is confronted from day to day.

Now then, presuming we have selected a normal boy with mechanical leaning and good public school education, we set him to work with a good journeyman. He works along from day to day and

takes enough interest in the work to ask questions, and of course the answers he will receive will depend upon the ability and inclination of the journeyman to explain. But after a time he has become practically proficient enough to do certain kinds of work himself, and if he is made of the right kind of stuff he will want to improve and get on to a better class of work. He is now getting inquisitive and the men in the shop are beginning to see that another journeyman is coming along, which for some reason is very distasteful to them. Probably jealousy or fear of his supplanting one of them prompts this.

It is at this stage that the Industrial School night classes fill a long felt want. I emphasize the words "night classes," because I verily believe that the young men working at any trade should be especially catered to, and to do so evening classes must be provided.

The Provincial Government evidently sees that something must be done to supply the future with mechanics who are specially educated and trained in various lines of craftsmanship and have instituted Industrial Schools. This training must be done by practical men with a sufficient knowledge of science to understand that there is a logical reason for every operation, that any work performed is not mere copying but that sufficient knowledge of principles is at the back of it to contend with usual or unusual conditions wherever they may arise.

That it is most essential to have practical experience first as a foundation, before piling on the technical is borne out by such men as John Smeaton, who engineered the building of the Eddystone Lighthouse, beginning life as a practical mechanic. Brindley, the father of canal building in England was a practical millwright. John Rennie who built the Southwark and Waterloo bridges over the Thames was a practical mechanic, who struggled on and finally rose to be a notable engineer. Also, Sir Isambard Brunel who built the tunnel under the Thames, which took twenty years to build, began life's work in a practical way. I mention these men to show that some of the world's greatest men lived and left plenty of evidence that practice is a sure foundation. They planned and brought to a successful

issue many of the world's greatest achievements in works of construction, before technical schools were thought of.

Again I say the night classes of Industrial Schools are going to fill a great gap. The object of these schools is to give in our business and others a happy medium education. An education that is composed of the practical combined with the theoretical or technical; and, by way of illustration, I may be pardoned if I refer to the work done in the Sanitary Plumbing and Heating Department of which I have the honor to be the lecturer and instructor at the London Industrial and Art School.

Market Report

TORONTO.

Toronto, March 29.—Plumbing markets are practically without feature, except that lead pipe and waste have taken a drop, discounts now being quoted at 20 per cent., instead of 15 per cent., as in the past. New lists have been sent out on enamelware bearing corrections and a few price changes of a few cents each, all in an upward direction. Trade continues very brisk, with excellent prospects ahead.

Collections are reported as slow. Tightness of money generally, change of government in the States and European conditions are each and all given as the cause for slowness, but just the exact difficulty is hard to point out. At any rate manufacturers and jobbers are beginning to pick and choose more closely as to whom they will sell, choosing largely those who will pay either cash down or cash within a certain time limit.

Enamelware—Market remains firm, with upward tendency. Revised lists of prices have recently been published correcting all errors, and in a very few cases slightly advancing prices. The advances are a matter of only a few cents, and are confined chiefly to high-class goods. Demand is heavy and factories are working to utmost extent to keep up.

Iron Pipe and Fittings.—Iron pipe continues without change of price and with fair demand. Inquiry for steam fittings has been increasing rapidly during past couple of weeks, so that not only are stocks reduced, but an early shortage is predicted. Prices continue unchanged at: 1 inch galvanized pipe, \$6.19; 1 inch black pipe, \$4.54; cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bush-

bushings, 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—Situation remains altogether without change, manufacturers still working overtime to meet demand. Prices are: Medium and heavy, 60 and 5 per cent.; 7 and 7 inch sizes, 45 per cent.

Lead Pipe.—Lead pipe is much easier than at last writing, and discounts have been changed from 15 to 20 per cent. Market is still weak, so that a further decline would not be surprising.

Solder.—Demand is only fair. Prices are: Easy wiping, 26; half-and-half, 30.

Boilers and Radiators.—Jobbers complain about still being unable to secure prompt shipments on radiation. One order turned in six weeks ago has been received only this week. This slowness, however, is confined chiefly to the smaller sizes. Boilers continue unchanged.

Metals.—General situation is sound, and has shown greater signs of strength during past two weeks. Iron and steel products still remain scarce, with heavy demand. Tin advanced $\frac{1}{2}$ c during past week, and is now quoted at 53 $\frac{1}{2}$. Copper is still quoted at 16 and 16 $\frac{1}{4}$, but is gaining strength slowly.

Lead advanced 10c per 100 during past week, and is now showing signs of greater strength. Spelter is dull, with little moving.

IMPROVEMENTS IN PLANT.

The following item taken from the Galt Daily Reporter gives an interesting account of improvements now being made in the plant of the Galt Brass Co., Galt, Ont.:

"In order to make way for the construction of a new warehouse, it was found necessary to remove the brick office of the Galt Brass Co., Ltd., whose plant is situated on the Macadamized Road. The office building measures 22 feet by 35 feet, and the job of moving the whole thing intact was given to Mr. Ruben Rogers, of Guelph.

"In the case of the office of the Galt Brass Co., the new foundation for the structure was first built. Then the whole building was undermined and supported on steel rails with the ends resting on a heavy beam. Under three points, a double rail track was laid in the direction in which it was desired to move the building. By means of a wire hawser attached to a horse-power windlass, it was pulled from its place on steel rollers. In this way the building was moved 50 feet west, and later, after the rails beneath had been placed in the

other direction, 15 feet south. All this was accomplished without any disturbance whatever to the interior. Even the telephone service was continued without interruption. This is the first time a brick structure has been removed intact in Galt.

To Build Large Warehouse.

"The space has now been cleared for the erection of a large new warehouse, 50 by 80 feet. It will have a nine-foot basement and a ground floor of nineteen feet. The new building will be used for the stocking of sanitary fixtures and plumbers' supplies, for which the Galt Brass Co. act in the capacity of wholesalers. The present stock room will be dismantled and utilized so as to double the floor space of the foundry, making it 80 by 40 feet. The large new warehouse is to be of red brick on a concrete foundation, and will be specially arranged to fill the purpose for which it is intended. The railway switch will be continued along the side of the building so that deliveries in carload lots may be made direct, and the same facility will also be available for shipping.

Other Improvements.

"A number of other improvements have recently been made to the plant. A hardwood floor has been laid in the machine shop and tool room, several new machines installed, and all the apparatus rearranged so as to provide the best possible service. Radiators have been put in to be connected with a steam heating plant.

"When the new store room is built and the other changes completed, the Galt Brass Company will have one of the best laid out plants in the town. All the money invested in the concern is local capital and the directors are well pleased with the progress being made. This year it is expected that any former twelve months' business will be doubled."

New Supply House.

Edmonton, Alta.—Carrol-Wilson, Ltd., the new plumbing and heating supply company, will have their headquarters in Edmonton, and will begin active operations at once. The company will carry heating appliances, closet combinations, enamelware, brass goods, fittings, etc. Their warehouses will be located on Columbia Street. The officers of the new company are: J. G. Carrol, president, who has for 30 years been connected with G. F. & J. Galt, Ltd., Winnipeg; George Wright, Vice-President; Ed. Williams, managing director of Peck & Co., Winnipeg; E. M. Carrol, Stewart Williams, secretary - treasurer; J. C. Wilson, general manager; L. E. Carrol, sales manager.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

JOHN BAYNE MACLEAN, - President
J. G. LORRIMAN, - - - Manager
T. B. COSTAIN
W. S. FARQUHARSON } Editors

Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, APRIL 1, 1913

THE ONTARIO CONVENTION.

Convention week is over and members of the trade in all parts of the country, whether members of the Association or not, will be interested in the lessons learned from brushing up against the leaders in the trade assembled together, and the benefits derived from such a gathering.

With reference to the convention as a whole the opinion is universal that it was not alone one of the best, but the best ever held in the history of the Association. Never before did such a representative gathering meet on a common basis to discuss the highest interests of the domestic sanitary and heating engineering profession. Some of the larger cities and towns sent down every local member. So keen was the interest in the possibilities of the convention that a few local committees were not satisfied with sending simply a delegation, but turned out in full force. From the smaller towns where only one or two members were to be found, enthusiasm ran just as high, so that the gathering was highly representative of the best men in the profession throughout Ontario.

The Convention came to a crucial point in the history of the Association. There are always those who hang on the outside and take a pessimistic view of the possibilities of such an organization. And there are those too who have continually been urged to join either by letters from the secretary or by personal contact with members. Those who have been hanging on the outskirts of the society saw during the convention that the Association was really a live body and that they could no longer afford to remain inactive, while those who came to the convention to see if it was worth while joining, left with the conviction that they had been missing something and that not only they but the other members of the trade in their respective towns could not do better than to unite their forces with those of the already organized members. Altogether the gathering was of such a representative nature and enthusiasm ran so high that the future success of the Association was absolutely assured.

The outstanding feature of the convention was the marked desire shown by the members to get down to the work of dealing with trade problems and evils. "Action" and "Settle it now" were the keynotes of all discussions. Every member appeared anxious to put his best efforts into the work, and get the greatest value not only from his own efforts but from the efforts of all the others. Where points of difficulty arose either in one or more towns, the matter was laid before the convention, and from the experience gained in other places a probable solution was rapidly arrived at. The members were anxious as never before to raise the Association to

the standard where the greatest amount of good could be done. Outstanding questions were eagerly discussed and so whole-hearted was the support of each member that it was commonly felt that the new life thus introduced would insure the future success of the Association. It is sincerely to be hoped that the enthusiasm aroused during this convention will not flag in the individual members during the course of the next year and that the officers will not lack the support of the individual members which is essential if any great work is to be accomplished.

A few evidences of this striving after practical results were the making allowance for a permanent secretary, the adoption of a resale price list for Ontario gotten up in loose leaf system with changes made monthly if necessary, the preparation of a system of examination required before admission to the trade, and the action entered upon against the manufacturers and supply houses to prevent selling outside the trade. If followed up and vigorously persecuted, definite results should come of these campaigns. To gain greatest success, however, it should be remembered that the action of every individual is absolutely essential.

At the close of the convention it was a rather difficult matter to tell just what had been the most important feature. As to business questions the problem no doubt is still unsolved, as members from various places are apt to regard matters in altogether different light according as they bear upon their own private business. But taking the convention as a whole, is there the slightest doubt that the record attendance was the most important feature? Some laid stress on the fact that through none but members being admitted, discussion was entirely free, but even this falls into insignificance in comparison with the benefits derived not only now but in future gatherings from such a large and enthusiastic gathering.



POINTED EDITORIALS.

Who ever thought there were so many Irishmen in the Association?

* * *

Lewis LeGrow, the silver-tongued orator of the society, tried hard to be relieved of official duties, but had already proved himself of too great value to the Association.

* * *

It will no longer be safe to speak of a sanitary or heating engineer as a plumber or steamfitter.

* * *

Sickness can prevent a whole delegation from attending a morning session.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

COLD WEATHER PLUMBING TESTS.

Editor Plumber and Steamfitter.—I am soon going to be in shape to test a large amount of roughed-in plumbing and as there is no heat in the buildings I wish to ask you what test you would consider the safest under the circumstances?—M.R.

We believe that you would be justified in using the compressed air test on these

the other hand if it wastes into a 2 inch pipe there would be no necessity, under ordinary circumstances, of using a 2 inch trap. We have, occasionally, observed lead traps of the one inch size used on kitchen sinks and we noticed that they generally stopped up quite easily and so gave poor satisfaction.—D.C.H.

DIAMETER OF VENT PIPES FOR TRAPS.

Editor Plumber and Steamfitter.—Is there any relation between the size of a vent pipe for a trap and the size of the trap itself? If there is, will you please kindly explain?—N.N.

It is the common practice in many parts of the country to use a vent pipe 2 inches in diameter for traps 3 inches or more in diameter. On a 2 inch trap a vent pipe 1 and 1/2 inches in size is used. On traps that are smaller in size than 2 inches the vent pipe should be of the same size as the trap. Reducing to a size smaller than that of the trap renders stoppage likely.—D.C.H.

REQUIREMENTS FOR LAUNDRY TRAY.

Editor Plumber and Steamfitter.—Kindly tell me some of the general requirements for a good laundry tray.—78

To meet the proper sanitary requirements it should, at least be of a non-absorbent material, have no sharp edges and no square corners, though the latter point may be sometimes omitted.—D.C.H.

SOME TOILET ACCESSORIES.

Editor Plumber & Steamfitter.—I am thinking about making an addition to my stock this year and would like to ask if you can suggest any line of toilet articles that a plumber could carry that would not take too much money tied up?—X.

In Fig. 3 we show what one person bought in this line, and with some study as to the requirements of your section, we believe that you can not do better than to make this picture the basis of your line. There isn't a thing shown but what every toilet room needs.—D.C.H.

WILL RADIATORS OR STEAM PIPES CAUSE COMBUSTION?

Editor, Plumber and Steamfitter.—Have you ever known of any case where a steam pipe or steam radiator has caused a fire, by reason of the pipe or radiators touching anything that would burn easily, such as wood or clothing?

R. H. Barnes.

We have come across many places where the pipe has touched wood and found the wood charred, but can not recall any time or place where a fire

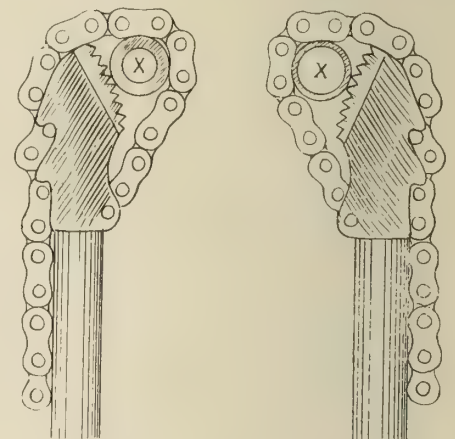


Fig. 2.

actually took place from such a circumstance other than a statement that was observed the other day in one of the dailies of another city. It was stated that a blaze was caused in a certain office of one of the sky scrapers by two umbrellas that were left standing against one of the radiators in the office. It might be true, but as we have frequently left clothing over night on steam radiators without damage to the clothing, we should have to be "shown" in this umbrella instance.

D. C. H.

HEATING UNDER WINDOW ON A CIRCLE.

Editor, Plumber and Steamfitter.—In a very fine dwelling that I have soon to heat there are two bay windows on a curve and the owner requires that the radiation should conform to the curve as near as possible. As I don't believe that a coil would do the business right,

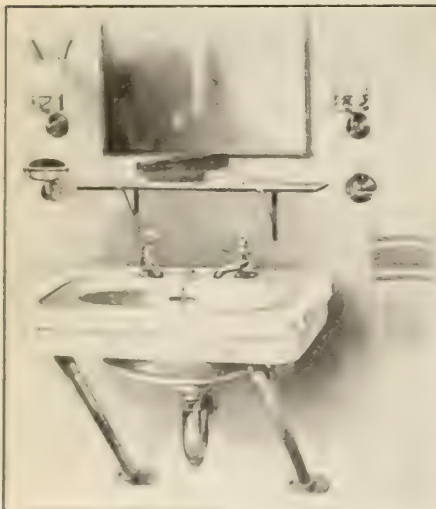


Fig. 1.

jobs. Put on a reliable air gauge and run the pressure up to at least ten pounds. In other words test the plumbing the same as you would test out a gas job and look for the leaks in the same manner.—D.C.H.

SIZE OF THE TRAP FOR KITCHEN SINK.

Editor Plumber and Steamfitter.—Is a lead trap one inch in diameter considered large enough for a kitchen sink under ordinary circumstances?—P.L.M.

It might have to be if your ordinance said so. We believe, however, that a lead trap of the size mentioned is too small, taking the work as it ordinarily runs. A trap that is one and one quarter inches would be much better, while the ordinary sink it would seldom require a trap larger than one and one half inches in diameter. Do not cut down the size of the trap to one smaller than the waste pipe it empties into. On

I wish that you would advise me as to how to proceed.

C. J. Howe.

We show in Fig. 2 a form of radiation that is used for the very purpose that our correspondent desires and believe that he will do well to make use of it in something very similar.

D. C. H.

COVERING DITCHED STEAM PIPE.

Editor, Plumber and Steamfitter.—Can you give me any pointers on covering a steam pipe that has to be run in a ditch? It is not worth while to buy the regular covering for such purposes and I would be obliged for any suggestions.

Rustic.

We show in figure 3. how this has been done successfully. We believe that the illustration conveys an accurate idea of the way in which to perform the task

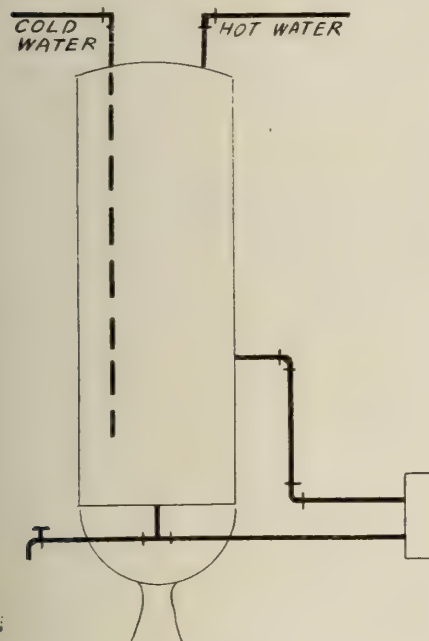


Fig. 3.

and would suggest that the return pipe be covered also in order to secure the most efficient results.

D. C. H.

ROOF DRAINS AND VENT STACK.

Editor Plumber and Steamfitter.—Would you consider it a good thing to run the roof drains into the ventilating stack?—A.R.F.

We believe that the better practice forbids that the roof drains shall be connected with the ventilating stack. It would not be right to use either set of pipes for any purpose other than that for which they are intended.—D.C.H.

MAKING UP OLD RADIATORS.

Editor Plumber and Steamfitter.—I have on hand a number of old radiators which need to be re-packed and, done in the ordinary manner it is a tedious process and one on which results are somewhat uncertain. I was wondering if you could suggest any special manner of doing it, or give me some hint that would be of assistance and so hope to read it in an early number of the paper.—Zing.

You did not state as to whether the radiators were of the push or screw nipple style. However, taking them as they come you probably have both types in your accumulation. As to the screw nipple kind, we would advise that in the threads of the nipples (in case they seem especially loose) you wind a strand of packing. This should take care of the leaks on all of this class of radiator.

The push nipple kind of radiators require a different kind of treatment. In the first place they should be most thoroughly cleaned. Also the hole in the radiator that they enter. If you do not do this, no matter how much care you take in other directions, you can bank on leaks. Make use of fine emery paper that has been worn somewhat. The iron, when cleaned properly by this method should shine. In making up the loops, if a strand of asbestos wicking is used, wrapped around the middle of the nipple so that when it is made home it will be flush with the face of the radiator loop. Such a proceeding will protect against leaks.

In making up the loops there are several different kinds of push nipple radiator vises that will give most excellent results and they give much greater satisfaction than the old style way of batting the radiator together with a board and hammer.—D.C.H.

HINTS FOR COAL STORAGE.

Editor, Plumber and Steamfitter.—One of my friends asked me for some points on a place to store the coal. I am not at all up on the matter, and if you can, in your most excellent paper, tell me some good points, I would be a thousand times obliged to you.

T. H.

For the ordinary house you will need a bin that will store anywhere from ten to fifteen tons of coal. This will give one the chance to put in a winter's supply at one time, an advantage when you can buy the coal "right" during the warm season. Locate the room so that you can get the coal from the driveway or street in the easiest manner. Line the cellar window with sheet iron, or the chute either, in case one is constructed. This coal room should be so sealed that the dust and dirt can not possibly get into the other parts of the cellar.

If one has plenty of room, two or three large cans may be used in the rooms as a place to put the ashes, the emptying of which may be done at the most convenient time. Cement flooring should be used. It is not any particular advantage to have a hole cut in the bottom of the partition for the coal to tumble through. Such is only a lazy man's practice. The dust will then get into the cellar. If you have to carry the coal to the boiler in scuttles you will the more readily know just how much fuel you are burning from day to day. If coal is used in the kitchen stove, the coal room can be partitioned so that the fuels for the different purposes can be kept separate.

D. C. H.

SEWER PIPE IN THE CELLAR.

Editor, Plumber and Steamfitter.—Would you advise any one to put the 4-inch iron sewer pipes under the cement floor in the cellar? If not, how can they be fixed? O. P. R.

The sewer pipe alluded to can be laid in conduits that may be left in the cement. Said conduits may be then covered with cast iron plates that are flush with the surface of the cellar. By doing the job in this manner one has the chance to always get at the sewer pipe in case anything may happen rendering it necessary to take out any of the pipes.

D. C. H.

TEMPERATURE CONTROL.

Editor, Plumber and Steamfitter.—Will you please state to me briefly the advantages of having a system of temperature control? Chas. Barton.

In the first place, it is claimed that a first-class system will save anywhere from 20 to 30 per cent. of the fuel over the ordinary manner of caring for the fire.

It gives also a uniformity of heat that, it is claimed, can not be attained in any other manner.

The use of such apparatus renders skill in managing the fire unnecessary, for beyond putting on the fuel, emptying the ashes, and seeing that there is enough water in the system, one has nothing to do.

In other words, it renders the warming of the home entirely automatic.

D. C. H.

Notes of Trade.

Moose Jaw, Sask.—W. G. Jones has recently been appointed plumbing inspector for this city. Mr. Jones has had twenty-seven years experience as a sanitary and heating engineer, and comes here with the highest credentials.

Kelowna, B.C.—Kelowna has recently appointed a plumbing inspector.

Tips for Helpers---By "Phoenix"

'WHERE IGNORANCE DOTH PREVAIL, 'TIS FOLLY TO BE WISE.'

Or it might have been called how "Shorty" lost his job. I don't remember that this friend of mine ever had his photo taken, and so I have borrowed a drawing of one of the top liners and trust that he will pardon the act.

I took it because it looked so remarkably like "Shorty," who never went much on general appearances. But he was long on the work at that, for in all my travels I never came across a quicker nor a better plumber than was this same "Shorty." He liked to sober up on Sunday by reading all the papers, and whenever he could get hold of one of the trade papers he was delighted. He changed his address so frequently that the trade paper editors had a hard time in getting his paper to him. His one besetting weakness was the love of liquor. Now you who read this do not for a moment get the idea that this is not a true story, for it is. I am going to submit the evidence before the article is finished that there are other cases of the kind happening every day, and it proves that, as far as some of the masters are concerned, their "sins be upon their own head," for in such a case as this a journeyman has license to make a kick.

Again did my artist friend unconsciously draw true to life, for the man behind the desk is as like the sour-tempered individual who turned this trick as one pea is like another. This incident happened in one of the "States," and about nine or ten years ago. One Saturday night, after getting his pay for the week, "Shorty" ambled up to the desk of the boss to make a request. He stood there for some time, the boss never looking up all the time. He must have been deeply interested in the "overhead expenses," I reckon. At length "Shorty" spoke up and asked to borrow the trade paper over Sunday.

"Threw it away," said the boss, "and if you are one of those trade paper students you needn't come around here any more. I'm done with you."

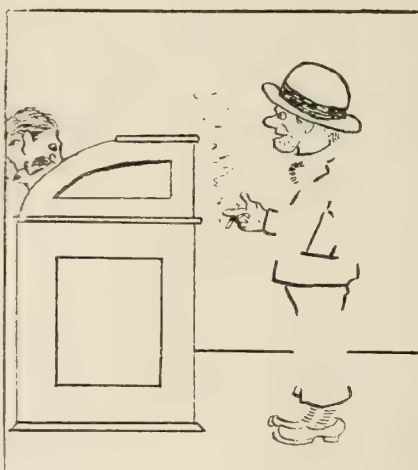
It is not necessary to repeat just what "Shorty" told that benighted individual, but it was sure enough. Now I most likely would not have recalled this incident, but only the other day I received a letter from a certain man, who is much interested in the welfare

of the trade, and I am going to quote certain passages from that letter. The party's name and address will be withheld.

—, Canada,
Feb. 28, 1913.

Mr. Phoenix.

Dear Sir,—I have been a reader of The Plumber and Steamfitter for the past four years, and have enjoyed the articles from your pen most thoroughly. . . . My heart is in the Sanitary and Heating business, and the more so because I see so many in the trade who are back numbers. Yes, sir! I know of firms who get the paper, and, after looking it over in a casual manner, then put it in the fire for fear that the men will get hold of it. I know lots of men who do the same, and who will not



adopt the new methods spoken of by yourself and others in the paper.—X. Y. Z.

I have known men so small-minded that they refused to subscribe for a trade paper simply because the paper had printed in each issue two or three pages of information similar to the "Questions and Answers" of The Plumber and Steamfitter. These men claimed that the spread of such information hurts their business. It is a well known fact that to-day it is a hard matter to find men who are really able to get results. Anything that can be done to aid in spreading accurate, practical information is a help and not a hindrance, and nine trade papers out of ten, regardless of the trade that they represent, certainly do this very thing.

The mechanic sells his skill for so much per day. The master must em-

ploy the mechanic in order to do business. Little skill results in poor work, much of which may have to be done over. Many a poor mechanic has become proficient by reading the trade papers. He might have remained in the same old rut if he had not done this. One that the writer remembers read a certain trade paper for one year, and then took the examination for plumbing inspector of his city and passed highest among a bunch of some 25 other applicants.

Consequently, the master who is so shortsighted as to either hide or destroy his trade paper in order that the men will not have a chance to read it and get next to some new information is the master who is working a direct hurt to himself; one that will injure him more than the men whom he seeks to keep in ignorance. The mechanic who will not avail himself of the many chances offered in the line of information in his trade that are printed in the trade paper certainly has not his own best interest at heart. In fact, to sum it up in regard to both the master and the mechanic, it can well be said "There are none so blind as those who will not see."

NEW PLANT COMPLETED.

The H. Mueller Manufacturing Co., of Decatur, Ill., are building a large Canadian factory at Sarnia, Ont., and have now practically completed their brass foundry and finishing plant. The Canadian company will manufacture everything that is now manufactured by the Mueller Co. in the States. Splendid shipping facilities are offered both by water and rail, and these the company have made use of to the utmost. All Canadian business will be handled entirely from Sarnia, as the new factory is not only a branch factory, but a separate plant in itself.

The officers of the company are:—O. B. Mueller, President and General Manager; C. G. Heiby, Vice-Pres. and Superintendent; Adolph Mueller, Treasurer; Fred. L. Riffin, Secretary, Assistant Treasurer and Assistant General Manager.

Lumsden, Sask.—The plumbing and steamfitting business formerly carried on by Gibson and Wallace will in future be operated by Fred. A. Gibson.

Complete Course in Sheet Metal Work

By L. W. KOSER

(Continued from last issue.)

At Fig. 4, plate 26, we illustrate a Hip Skylight.

The patterns we must develop to complete this skylight are first the patterns for the top of the Hip Bar at S, then for the bottom of the Hip Bar at M and for the top of the Jack Bar at O, also to find the proper shape of the Hip Bar which must be an angle similar to the Ridge Bar shown at Fig. 5 but not as deep as this bar.

Fig. 6 shows the Hip Bar which is developed from the Common Bar Fig. 7.

Now refer to Plate 27.

At Fig. 8 we erected at a one-third pitch a cross section showing the profiles of the Ridge Common Bar and the Curb, with the different points of the Common Bar running into the Ridge and Curb. Number each of these points as shown. Now drop a vertical line from the centre ridge line down past the point "R" about three times the distance from R to point 1 on the top of the Ridge or to the point S.

Now drop a line down from the outside of the Curb line of Fig. 8 to the same depth as point S, Fig. 9.

Draw the heavy line S-B and the

heavy line B-A the same distance as S-B.

This heavy line represents a corner of the Skylight Curb in plan or as if you were above it looking down. Next draw the line B-A half-way between the line S-B and B-A or at an angle of 45 degrees from each and until it touches the centre line S-R.

The line A-B represents in plan view, the centre line of the Hip.

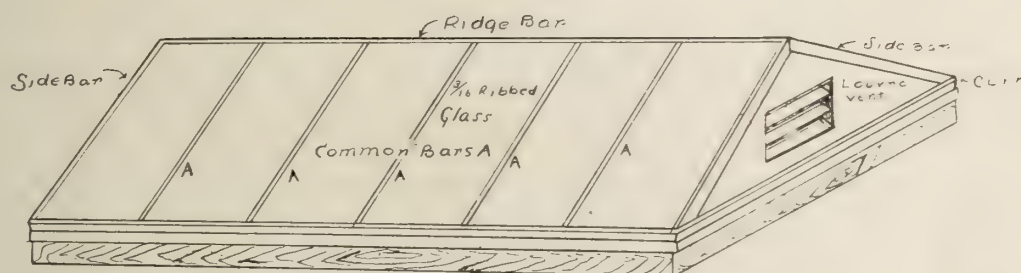
Now draw the lines B-M and A-N at right angles to A-B. Then the line N-M.

Continue this line A-N to N-T, Fig. 10.

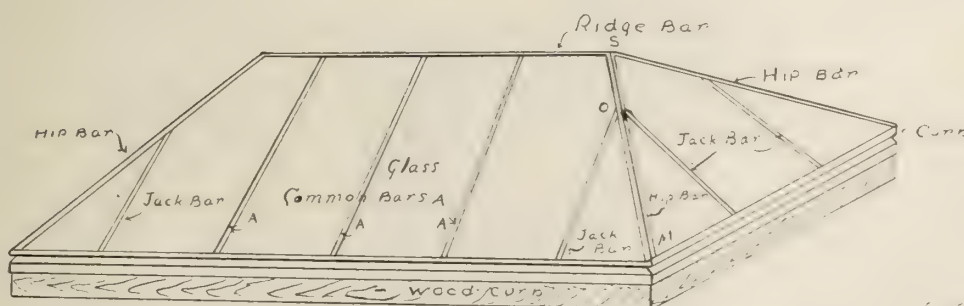
Draw the line T-M, Fig. 10.

(To be continued.)

26



DOUBLE PITCH SKYLIGHT FIG. 1



HIPPED SKYLIGHT FIG. 4

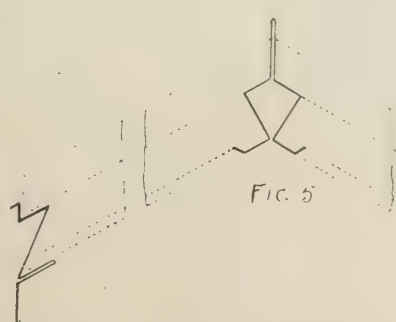


FIG. 5



FIG. 6
Hip Bar



FIG. 7



FIG. 8

FIG. 9



Display of electrical Fixtures and Specialties in Retail Store of E. S. Coppins, Plumber, Steamfitter and Electrician, Woodstock, Ont. Inset Shows Photo-graph of Mr. Coppins.

Makes Profit Out of Electrical Goods

E. S. Coppins, of Woodstock, Carries a Good Stock of Fixtures, and Finds Them a Paying Line—About \$7,000 Worth Carried.

"In Toronto," says E. S. Coppins, "a man is a plumber, a steamfitter, a gasfitter, a tinsmith, or an electrician; he can specialize in any one of them, and get plenty of work to keep him going; but here in Woodstock if we took work in one line only we'd starve." But because it is necessary to run more lines than one does not infer that a good business cannot be done in each line. Mr. Coppins does a big plumbing and heating business, has a very aggressive tinshop department, does a profitable business in electrical wiring, and has a large retail trade in plumbing fixtures, electrical specialties, and gas and coal stoves and ranges. The retail end of the business is considered by Mr. Coppins as of great importance, both as an advertisement for his contract business and as a valuable source of profit in itself. The front part of the store is devoted largely to the display of electrical specialties, which he states sell freely, giving a profit of about 100 per cent. Specialties, such as electrical hair brushes, hair combs, electric irons, bells, gongs, buttons, motors, transformers, indicators, flashlights, receivers, transmitters, as well as lamps, shades and fixtures, make up the large stock of these goods carried. Window displays of these goods are arranged from time to time, which help greatly in sales. Speaking of the length of time such goods would lie on the shelf, Mr. Coppins states: "Some lines move rather

slowly, but never so much as to make stock old. Most goods move out in the course of six months at least, and many move much more rapidly."

In connection with the display of plumbing goods, Mr. Coppins has fitted



Exterior view of E. S. Coppins store, and Delivery Outfit.

up complete four bathrooms showing different styles of fixtures and different quality goods. This kind of display he considers very important, and feels that

even as it is he has too little space to devote to such arrangements.

Some idea of the importance which this plumber places in his retail business may be judged from the value of the stock he carries, which amounts to about \$7,000. Much of this he has stored away in his store house at the rear of the building, so that only seasonable lines and lines of lighter weight are kept on display in the store.

Mr. Coppins started in at the plumbing trade as a boy under the instruction of J. J. Blackmore, with whom he worked for two years. He then returned to Woodstock, where he worked first with Jas. Catting and later with Patrick & Powell. Before he had reached his twentieth year he had a shop of his own, and from that time till now during his whole twenty-two years in Woodstock his business has been steadily on the increase, even in the face of keen competition. At the present time Mr. Coppins employs a staff of eight, made up of two plumbers, two tinsmiths, one electrician, two helpers and one stenographer. The business has now reached the stage where the proprietor does not find it necessary to put on overalls and twist himself into a thousand different shapes in installing pipes and fixtures.



Collingwood, Ont.—J. A. Caslake has bought the business recently conducted by The Collingwood Electrical Construction and Repair Company and will continue the business hereafter. Mr. Caslake has secured the services of L. A. Willis, expert electrician, Toronto, to help him in managing the business.

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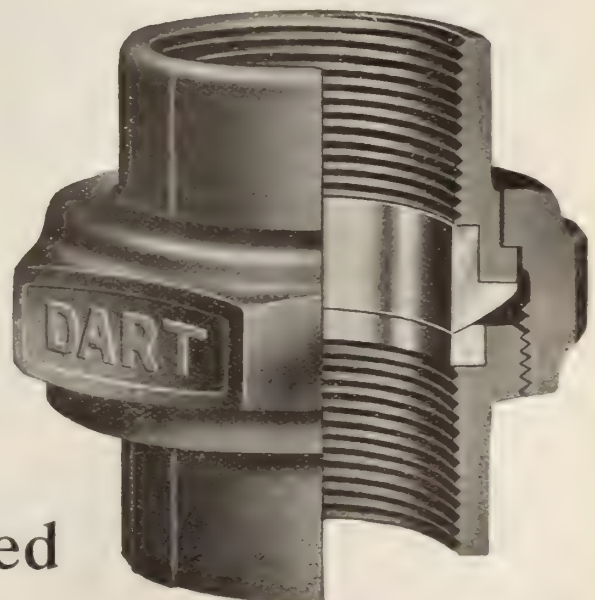
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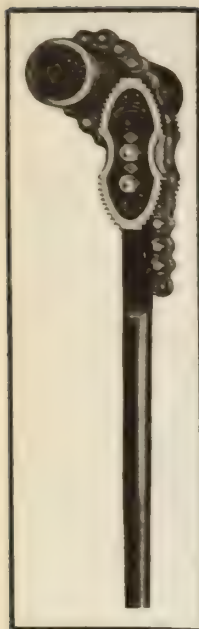
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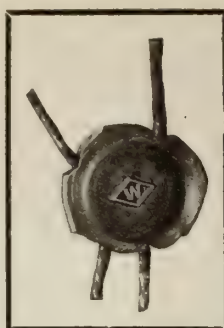
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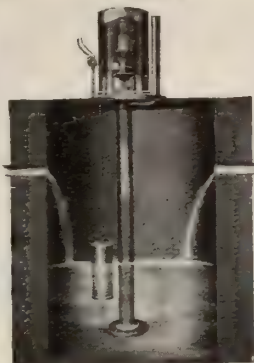
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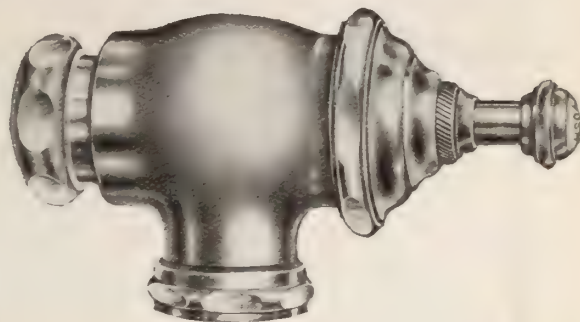


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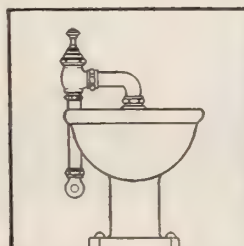
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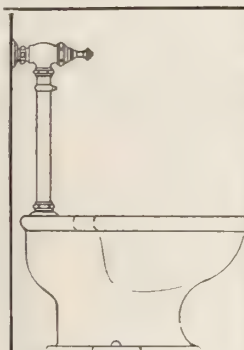
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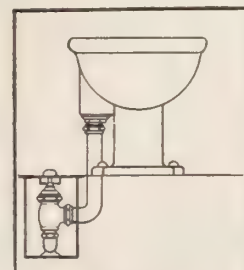
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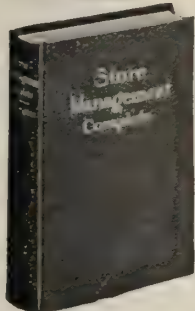
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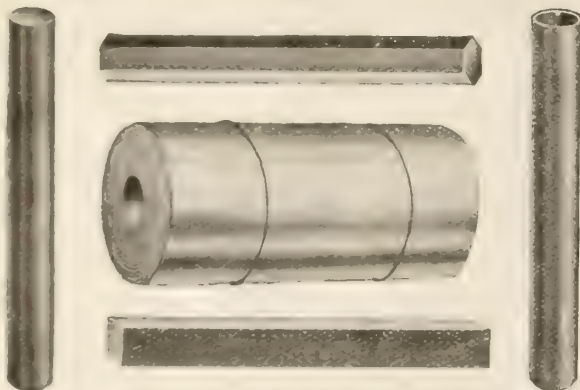
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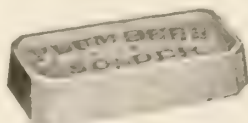
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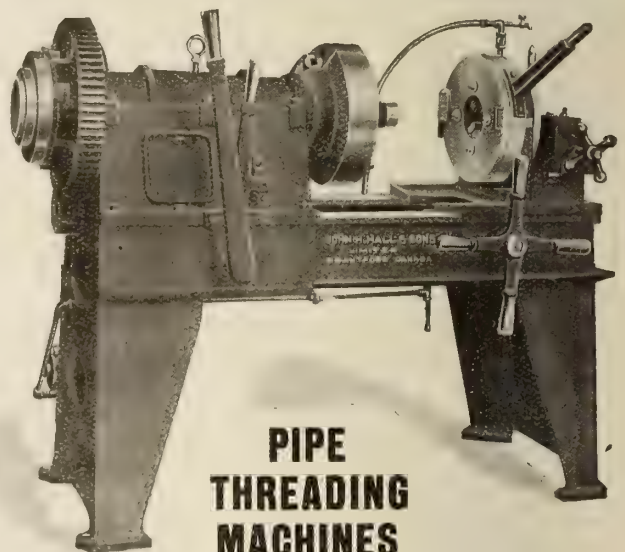
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Vol. VII.

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No. 8



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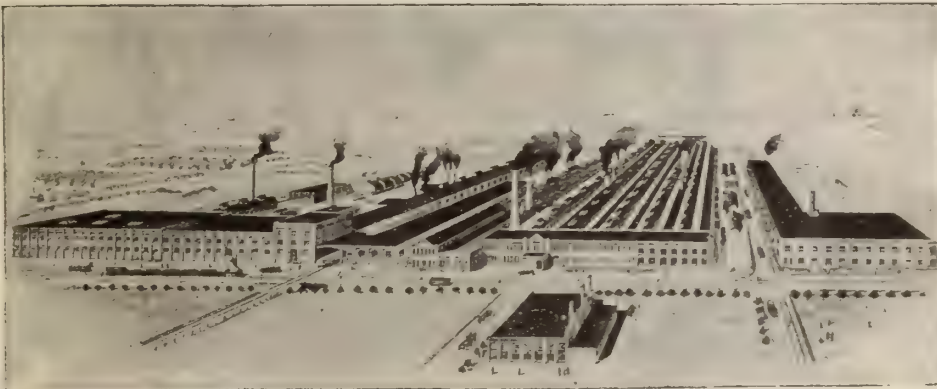
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WAREROOMS:

MONTREAL WINNIPEG VANCOUVER

CATALOG FURNISHED UPON REQUEST



"Standard Sanitary"

Porcelain Enameled Lavatories

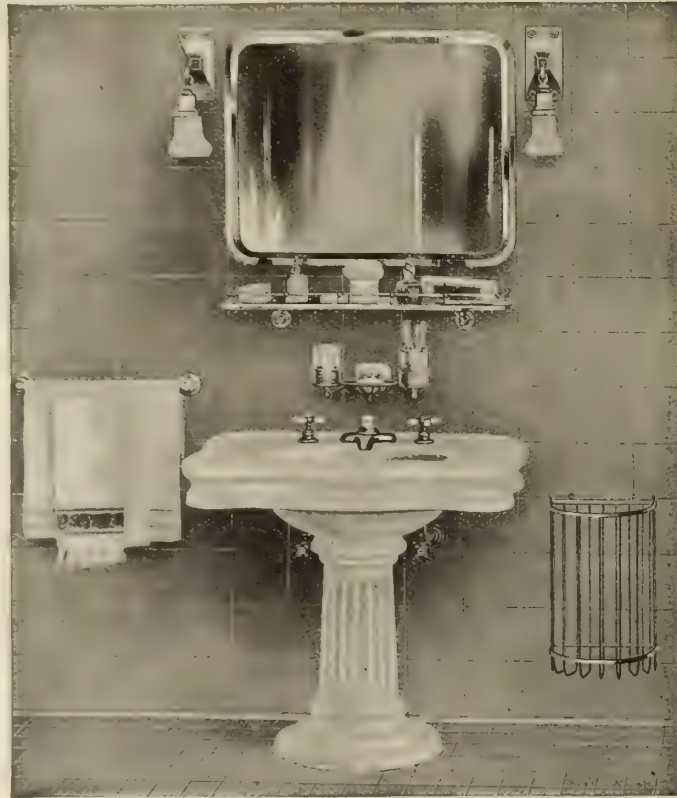


Plate P-3070 X.

"Standard Sanitary" Porcelain Enameled "Dallas" Lavatory with Slab, Oval Bowl and rear Outlet and Apron all in one piece, supported on Porcelain Enameled Fluted Column Round Pedestal. Fitted with P-10251 "Alton" Compression Combination Supply and Waste Fitting: $\frac{1}{2}$ in. P-10427 Supply Pipe and $1\frac{1}{2}$ in. P-10463 "P" Trap. Lavatory furnished enameled all over only.

The "Standard Sanitary" line of porcelain enameled Lavatories comprises the largest assortment of designs on the market, all of which are of first quality of manufacture, highly sanitary and warranted against defects in material and workmanship.

Every genuine "Standard Sanitary" Lavatory bears the "Standard Sanitary" Green and Gold guaranteed label. Without this label it is an inferior substitute and should be rejected.

For the convenience of architects, plumbers and prospective builders, we maintain Show-rooms at Toronto and Hamilton, where "Standard Sanitary" Lavatories and plumbing fixtures for every requirement may be inspected and information regarding their efficiency and adaptability obtained.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

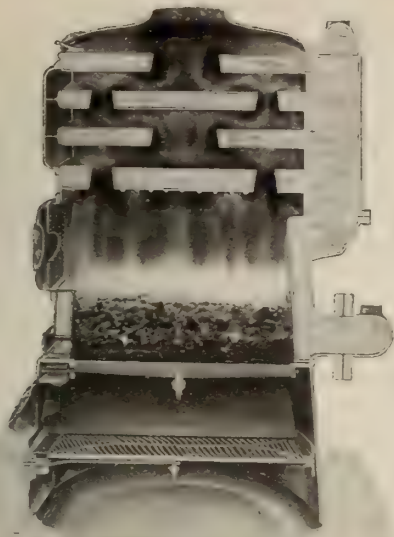
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

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Hamilton Store:

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The
“DAISY”
Hot Water Boiler

Over 50,000
in Use

Speaks for Itself!

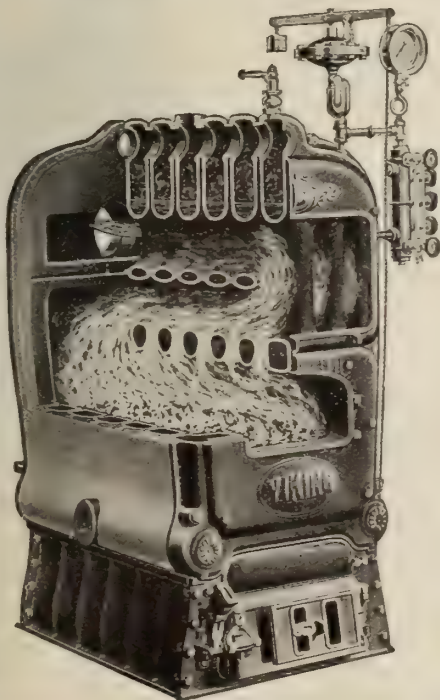


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The MECHANICS' SUPPLY CO., QUEBEC, QUE.
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The universal success, the never-disappointing operation of the Honeywell hot-water system has proven conclusively that the theory upon which it is based is correct even to the utmost detail.

An increased and positive circulation; an instantaneous heat under perfect control; quickly increased or checked; the use of smaller valves and piping; the sending of even heat into radiators at extreme distance from boiler; the one-end radiator tap, the saving of floors from "butchery": beams from weakening and ceilings from leak stains; minimum amount of piping an easy layout for the fitter, enabling expeditious placing of radiators, and the minimum cost of installation and operation.

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The bodies and bonnets of our Hot Water Quick Opening Radiator Valves are made in one piece, thus having a great advantage over other valves, as it leaves one less joint or possible leakage. The cone-shaped Disc prevents sticking.

Our superior Steam Radiator Valves have very low seats and a high lift of Disc.

We manufacture both valves from 1/2 in. to 2 in., with or without union, also union elbows.

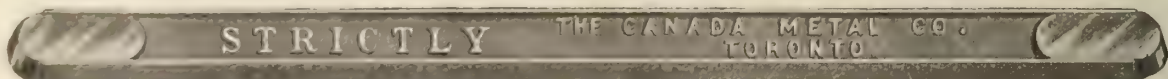
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Steam Radiator Valve.

MILLER LIMITED - LONDON, CAN.

ASK YOUR JOBBER FOR



STRICTLY SOLDER

IT GIVES PERFECT SATISFACTION. OUR GUARANTEE BACK OF EVERY POUND.

Manufactured by

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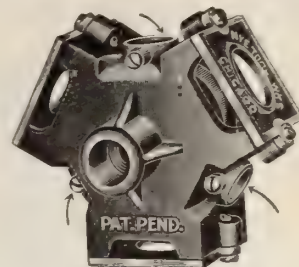
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I'm Nye the Die Man

THE NYE THREE-WAY DIE STOCK holds $\frac{1}{2}$, $\frac{3}{4}$ and 1-inch solid dies, size of block $2\frac{3}{8}$ square. The tool is a one piece casting, containing three die boxes and three bushings, all of which are parts of the one casting.

Each box is equally distant from the centre, thereby distributing the weight equally. The bushings are tapped into the stock body immediately opposite each die, and corresponding in size to that die. There is nothing loose about this stock that can be lost, no separate parts are necessary. The dies are locked in each box, and there remain until they are worn out.



A close nipple can be cut if desired. A reducer bushing can be used, allowing the use of a $\frac{3}{8}$ -in. die if desired.

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BLACK and GALVANIZED. SIZES, $\frac{1}{8}$ IN. TO 4 IN.

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Proof



Mark



There's guaranteed pull for you in every Improved "Vulcan" Chain Pipe Wrench. Each chain tool carries the grey seal of assurance after having been "pulled" in a testing machine to two-thirds of the chain strength indicated in catalogue table. The mark is a proof of "pull" and the "pull" is a guarantee of uninterrupted service in the tool as well as of safety to your person. None other than the improved "Vulcan" can tell the story. Look for the "Grey Seal" and double-ended jaws.

Ask your dealer. Chain Tool Catalogue Free.

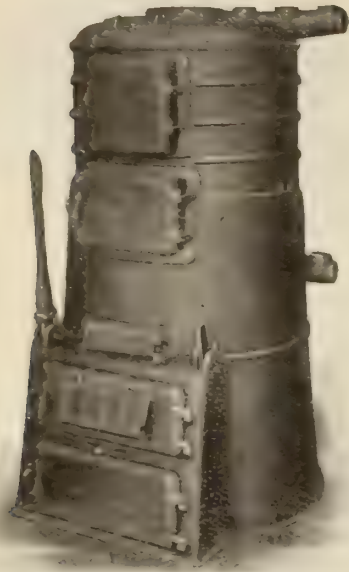
J. H. WILLIAMS & CO.

SUPERIOR DROP-FORGINGS

77 Richards Street,

BROOKLYN, NEW YORK CITY

STEEL AND RADIATION, LIMITED



No. 6 H. B. "King."

OUR PRODUCTS

"KING" HOT WATER BOILERS,

Sizes 1 to 9½

"ROYAL" ROUND STEAM BOILERS

**"ROYAL" SQUARE STEAM and
WATER BOILERS** 15 to 48 inch.

**"ROYAL" TANK and LAUNDRY
HEATERS**

**"KING" and "IMPERIAL"
RADIATORS** Water and Steam

"Made in CANADA by CANADIAN People."

Install our products as outlined above and insure for your customer "Satisfaction" and prompt shipment, which means greater profit to you.

It is apparent now that the demand for Boilers and Radiators will be greater than last year.

We are better equipped to meet this demand than any other manufacturer, with our new and modern plant at St. Catharines, together with our Toronto plant running night and day. Our output has been more than doubled.

The "KING" Boiler is favored and accepted everywhere as representing Efficiency of the highest type at lowest coal consumption of any boiler on the market.

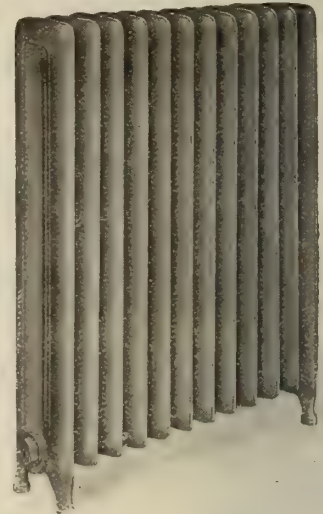


S-36-8 "ROYAL" Steam.

Our "Royal" Round Steam and Square Sectional Steam and Water Boilers are considered by experts and users to be the best on the market.

"King" Radiators are so well known that it is only necessary to mention them.

We would draw attention to our new "Imperial" Radiator, made only in one and two column plain, in every height. See cut showing clear cut lines and clean, smooth castings.



"Imperial" 2 column.

We appreciate your Radiator orders, but Boiler orders are equally acceptable.

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Catalogues mailed on request.

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Value of Attractive Window Displays

Few Sanitary and Heating Engineers Pay Sufficient Attention to This Subject
—Good Results Can be Obtained—Description of a Clever Display by Boyle & Son, Napanee.

The window display shown below which was recently arranged in the store of Boyle & Son, Napanee, Ont., shows what can be accomplished in the line of window displays with plumbing goods.

In this case the window is of real use, and through drawing business to the store proves itself to be a valuable asset. There are few plumbers throughout the province, cities and towns included alike, who really make use of their windows. Some can boast a fairly attractive show room, but when it comes to the window generally a lot of fixtures altogether without systematic arrangement are shown. Or if larger fixtures, which really mean something to the average passer-by are on display, they are arranged in such a way as is very unlikely to attract attention. Then, too, not enough care is taken in keeping displays clean, so that after a window has been in for some months (as is often the case) quantities of dust are found to lodge on the various articles.

A glance at the window shown below impresses the passer-by with five main things—namely, artistic arrangement, completeness of display, attractiveness through cleanliness, high quality of goods displayed, and incidentally the class of work done by a firm paying such attention to displaying plumbing goods.

In the first place, the display is artistic. Although arranged in a comparatively small window, there is no appearance of crowding. Each fixture is shown in its proper place and installed as if ready for use. To render a more attractive appearance the floor of the window is covered with light-colored linoleum in simple design; a small rug, such as is commonly used in bathrooms, is also shown; and towel racks are displayed, with proper towels on them.

In every way the display presents a complete bathroom. Not only are the essential fixtures, such as bath, closet and basin shown, but also smaller fix-

tures, as towel racks, toilet paper holder, holders for tumblers, tooth brushes, soap, etc. The introduction of the spray and curtain show how these may be installed in any bathroom without radical changes.

All fixtures show high-class quality and such as are desired by the best customers. To aid in showing these off, the white enamel background and linoleum are of great service, and at same time present an appearance of marked cleanliness so much desired in the bathroom by every housewife.

Then, as already intimated, the display is one such as would inspire confidence in the workmanship of such a firm.

Where competition in the plumbing trade runs high, and where every effort put forth to catch the eye and attract the attention of the public has an actual dollars and cents value, the outward appearance presented by a plumber's shop

Continued on page 9.



A window display arranged to bring business—Shown by Boyle & Son, Napanee, Ont.

Discuss Standardizing of Ordinances

Meeting of Plumbing Inspectors at Winnipeg Promises to be Successful Event
—List of Subjects to be Discussed—Calgary Sending a Delegation.

Winnipeg, April 7.—The convention of Plumbing Inspectors and Sanitary Engineers to be held in the Industrial Bureau Building, Winnipeg, Man., has every indication of being a great success. Standardizing of ordinances which will be the main theme about which all discussion will centre, and which has been the first and foremost reason in ever proposing the convention is something which has been sought by the trade for a long time.

Those organizing the campaign have entered into the work with might and main, and have done everything in their power to bring matters to such a crisis that definite decided action will be taken.

Many subjects will of necessity come up in considering a uniform plumbing by-law. So as to prevent these being attacked at random a list has been carefully prepared and each topic given into the hands of one man who is an authority on that subject. Ten minute papers have been carefully prepared by these men and will be read at the convention when the particular subject comes up for discussion in considering a uniform by-law. The following is a list of the subjects suggested together with the men who are to deal with them:—

Tests—Water, air, and smoke—J. R. Hinshack, Edmonton, Alta.

Drains, soil pipes and main waste pipes, material and construction—Geo. G. Taylor, Saskatoon, Sask.

Branch waste pipes, material and construction—J. T. J. Vallance, Lethbridge, Alta.

Pipe terminals—W. McFarlane, Winnipeg, Man.

House trap, for and against—R. J. Thomas, Lecturer on Plumbing in the Technical School, Winnipeg.

Fixture traps, requirements—J. McNeill, Winnipeg.

Vent pipes, their necessity and application, sizes and material—E. Samson, Winnipeg.

Local vents—T. J. Doughty, Moose Lake, Sask.

Steam blow-off tanks, back water valves, etc.—A. G. Warr, Prince Albert, Sask.

Examination of plumbers—E. P. Fletcher, Calgary, Alta.

The full programme will not be completed till a few days before the con-

vention, but arrangements for the business sessions and entertainment of delegates are already well under way.

Lists of the subjects suggested, such as given above have already been sent out to all delegates so as to enable them to give the matter some thought beforehand and thus be in a position to view the various phases and make up their minds as to the best course to pursue.

Although the movement to standardize ordinances has been launched by Western men and though the intention is to reach a uniform by-law for the Western provinces, the question is of just as vital importance to every member of the trade in the East, and delegates from all quarters will be made entirely welcome. This is an opportunity which should not be let pass. It is in the interest of every individual to see that some definite conclusion is reached. If you can't go yourself see that someone else does and thus reap the benefit of all that takes place.

Calgary Delegation.

Calgary, April 10th.—The convention of Western plumbing inspectors which is slated for the 16, 17 and 18 of this month in Winnipeg, bids fair to be of a most successful character.

Invitations have been sent to the plumbing inspectors of all cities and towns from the Twin Cities west, and the replies received show a most encouraging interest.

The different associations of sanitary engineers and the local unions of plumbers have also been asked to send delegates, so it is expected that the attendance will be quite large.

Calgary has decided to send no less than three delegates, and these gentlemen being of large and varied experience in sanitary science, will uphold the Calgary reputation for ability and thoroughness.

The city council will send E. P. Fletcher, the chief plumbing inspector (who has been practically the prime mover in the getting up of the convention), while the Calgary association of sanitary and heating engineers have delegated C. E. Good, of the firm of Good & Lepper, to represent them at the meeting. The local union has also elected a representative from that body, and Alexander Milligan will journey to Winnipeg with the other Calgary delegates.

A very pleasing event took place in the plumbing inspectors office, when the staff took advantage of the opportunity afforded by this convention, of presenting Mr. Fletcher with a beautiful leather traveling bag, completely equipped, and the following address showing their appreciation of his unfailing courtesy at all times and of the fact that in attending this convention, he will assist at what is probably the largest forward movement ever taken in the history of sanitation:—

April 8th, 1913.

Mr. E. P. Fletcher,

Chief Plumbing Inspector, Calgary.

Dear Mr. Fletcher:—

We, the undersigned members of your staff wish to show our appreciation and regard to our chief, and so we present to you a small token which we hope you will find useful in your travels.

We believe you are about to make history in the plumbing world.

May you have every success in forming a standard code at Winnipeg, and be the means of raising the standard of the trade.

We are yours faithfully,

Andrew S. Milne.

John Bewick.

Geo. A. Marshall.

F. J. Hawkes.

E. S. Morton.

David M. Turner.

In reply, Mr. Fletcher thanked the staff for their kind and thoughtful gift, and said that he hoped to see many of the difficulties that beset the path of the sanitary engineer, the journeyman plumber, and the plumbing inspector smoothed away to a large extent by the action taken at the forthcoming meeting in Winnipeg.



HOW CAN I FIND A LEAK IN A VACUUM JOB?

Editor, Plumber and Steamfitter,—Please tell me how I can quickly locate a leak on a vacuum job?—L. H. Walters.

If the leak is a good-sized one it will make a hissing noise, and you can easily run it down; but if, as is generally the case, it is two or three small leaks, they will be harder to locate. Test for them just the same as you would test for gas leaks and you will get them in time.—D. C. H.

Review of Work Done at Convention

Splendid Results Achieved at the Ontario Gathering—Methods of Eliminating the Practice of Price Cutting—Directors Meet and Arrange to Begin the Work Laid Out For Them at Once.

The annual convention of the Ontario Society of Domestic S. and H. E., though past and gone for another year, has undoubtedly left behind it an influence which will continue to work along throughout the year that is ahead. One of the outstanding features of the convention was the general recognition expressed that in order to accomplish anything definite and to make the association of real value to its members, it was essential that the trade should "get together and stick." To this end much of the business at the convention tended.

In the first place, the value of a permanent paid secretary was pointed out. The report for the past year showed that much good work had been accomplished through the efforts of Secretary Frankland, and it was thought advisable that the society secure the services of some man who would be able to devote all his time towards association work.

It was felt that the time had come when the plumbers in each town or district should drop all petty differences, cease to kill the business of each other by disastrous price cutting and rivalry, and get together and work to the common end of bettering the trade. In this connection the key to the whole question of dealing with bulk tenders was found to lie in friendly relationship between those figuring on the job. Thus, the hated practice of peddling a contract, announcing to each man the other man's price, and striving to gain even a lower figure still, would to a great extent be done away with.

Also it was decided that no member of the association should figure on a job in the town of a fellow-member without first consulting the member in that town.

All these as well as the setting of a definite examination to enter the trade, the issuing of permanent certificates, the adoption of a uniform resale price list and heating contract, and the forming of an endowment fund all tend towards more close organization. This standing together is undoubtedly one of the gravest necessities that the sanitary and heating engineer of to-day has to face. Competition is keener than ever it has been before. Though much building is being done, and there is prospect of plenty of work ahead, still the very abundance of work appears to be making keener competition. The general contractor is here to stay, and will continue to get the lowest figure possible on

sub-contracts so long as one plumber is willing to cut a little farther than his opponent.

Local organization appears as one of the best solutions for all existing evils. What cannot be accomplished by the individual can in many cases be brought about by the society. But whether or not the sanitary and heating engineers in the various towns throughout the province act on the suggestion given out at the convention and form associations is perhaps of less importance than that they should take the lesson to heart individually. Just because all are not willing to join is no reason why the in-



J. A. Caslake, of Collingwood, Ont., chairman of the Arbitration Committee.

dividual man should not take any steps towards helping along the movement. If each plumber decided to put his own business on the best possible basis and to do his best to establish friendship and confidence with his rivals in business, no doubt much of value would be accomplished.

Meeting of Directors.

The new board of directors of the Ontario Society of D. S. and H. E. held their first meeting on Thursday, March 10, in the office of Purdy-Mansell. At the meeting it was moved and seconded that Wm. Mansell be asked to act as honorary director in an advisory capacity. To this Mr. Mansell agreed.

Pending the appointment of a permanent secretary for the society, the late corresponding secretary was prevailed upon to carry on the work.

The committee, consisting of L. Le Grow, Wm. Mansell and F. R. Maxwell, appointed at the convention to look after the securing of permanent headquarters for the society, have already got right down to business, and will have a report to make shortly with regard to the results of their labors.



VALUE OF ATTRACTIVE WINDOW DISPLAYS.

(Continued from page 7.)

is of vast importance. Getting people interested in various fixtures and various plans of bathroom layouts is the first step towards getting business. With the people of to-day appearance counts for everything in a bathroom. They are not so particular as to whether a joint is well wiped as they are to what appearance the fixtures are going to make. Apart from the fact that they require a job to work right, workmanship is second and appearance first.

Here, then, is something to which every plumber should pay more attention. Boyle & Son find it a paying proposition to spend time and money in arranging displays such as the above, and claim that they bring to them much new business. Almost every shop has a window of some kind. Try to make it a real asset to your business rather than a drag.



PUTTING ASBESTOS PAPER ON FURNACE PIPES.

Editor, Plumber and Steamfitter,—Will you please tell us the best manner of fastening asbestos paper on furnace pipes and register boxes?—Cobacok, Ont., "Asbestos."

Many simply cut the paper just to fit the size of furnace pipe, allowing about one inch for a lap, and then paste the lap with flour paste.

To our mind it is better to have the asbestos paper slightly dampened, either by sprinkling or else stored in a damp place for a day or two. The paper will then lie closer and smoother. In some cases we have known of its being entirely pasted on, but that is not necessary if care be taken as suggested. In covering the register box, the paper can be led to place with strips of lath over the seams, if nothing else is to be used as a covering on the inside. We believe that it is considered a good thing to place tin over the asbestos.

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS
Macpubco, Toronto; Atabek, London, Eng.

JOHN BAYNE MACLEAN, - President
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Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, APRIL 15, 1913

Prevention or Cure

An ounce of prevention is worth a pound of cure.

This old adage is one of the wisest that the sages of bygone days have passed on to us, for it is more often demonstrated than the usual run of adages, saws and proverbs.

Consider it as applied to the work of the sanitary craft. People think highly of the doctor because he cures disease. Do they ever give credit to the sanitary engineer who prevents it? The latter is fully as important as the former and equally deserving of credit.

This is no mere idle assertion or boast. History's pages are filled with records of scourges and plagues which swept whole continents with devastating force. Hundreds of thousands of people were periodically swept off the earth by the ravages of the black plague, or cholera as it is known to-day. The disease is comparatively unknown to-day in civilized countries. But what of the countries of the East? The plague is still taking its deadly toll in Oriental lands just as surely as it did in Europe in medieval days.

Plagues arise from filthy conditions. In the olden days, the cities had no adequate means of disposing of garbage and sewage. Foul, foetid matter was allowed to accumulate in the yards, the streets and the sewers. Reeking stenches arose and disease germs were everywhere. Lack of proper facilities precluded personal cleanliness. The result was that every condition encouraged the spread of disease and, when once the plague started, it swept with startling speed across continents.

The same conditions which prevailed in Europe in Medieval days still obtain in the East. The European, who walks through the poorer section of a Chinese city, is courting fever. Rolling filth on every hand and the air is literally blue with the reek. And consequently, cholera is still the commonest enemy of mankind in these countries.

The immunity that civilized people enjoy has arisen solely from the perfecting of sanitary devices to maintain cleanliness in the home and to carry away sewage. The work of the sanitary engineer has done as much to

reduce the death rate as the researches of medical science. He has worked along the lines of prevention; and has found the solution.

When the sanitary engineer looks back at what he has done and looks ahead at what is still waiting for him to accomplish in the improving of conveniences, he must realize the important part that he plays. And some day, we trust, he will get public recognition.



The Business Outlook

Dealing with the business outlook, The Financial Post states that information reaching it indicates no restriction of commerce, as a result of money conditions, but it has to be admitted that expansion is being contracted. Some general evidence of this is found in the bank earnings for March. More specific, as evidence in this respect, is the accumulation of demands on financial agents for capital for extending industrial plants. It has been the custom of Canadian banks, when deposits permitted, to make advances to manufacturers for the purpose of increasing plants. Through necessity, this class of accommodation has had to be restricted, and in consequence applications to financial agents for capital have been increased.

In the entire Dominion, the chief concern is the procuring of new capital to provide for expansion. The West will feel the need of more capital perhaps to a greater extent than the East. Already Eastern loaning houses are declining large loans and moderately large loans. For those around \$20,000 for city purposes there is a good demand, but they, at the present time, are being declined very generally. What money the companies have at their disposal is being distributed amongst the most likely borrowers for farms and homes. For this purpose the supply is going to be far short of the volume of last year.

Reports from the West indicate that the season is quite normal for seeding and that the acreage seeded will be larger than last year. Generally speaking, business has a tendency to drag during the seeding period and this year will be no exception.

The Business Outlook

REPORTS SHOW that business in the sanitary and heating trades throughout Canada are finding conditions satisfactory. Despite the tightness of money, building operations will be conducted this year on a larger scale than ever; and this will mean plenty of work for the sanitary and heating engineer. In the meantime, business is starting briskly.

Only one feature of the situation in Canada gives any room for doubt or worry. Money is scarce, so extremely scarce that, unless some improvement takes place,

ness, therefore, will be to put the ban on wildcatting and rash speculation. Thus do blessings often visit us in disguise.

The money stringency is felt in many ways. Collections have not been entirely satisfactory since the first of the year, although in all parts but the West there has been a marked improvement of late. In the West collections are still so slow that a certain amount of uneasiness is inevitable. That conditions are fundamentally bad is not accepted by even the most pessimistic; the fact remains, however, that the slowness is likely to continue until the Fall.

The tightness of money is not checking business, however. Increases in volume of turnover are being shown all along the line. Manufacturers are finding they cannot keep pace with orders. "We have more business than we can handle," is a phrase which promises to become stereotyped through general and constant repetition.

One of the most encouraging features of the business situation at the present time is the way in which activity perseveres in spite of manifest discouragement. This is true of all parts of the civilized world. In Europe the dampening influence of the Balkan war and the ever present possibility of a general outbreak has failed to check the active tone of industry and trade. In the United States, political disturbances of more than usual potentiality have not been sufficient to put a check on the improvement of trade and the expansion of industry. The time was when presidential years in the United States were counted as lost years from the trade standpoint. To-day—as the cartoonist very aptly shows it—the motor truck of business speeds along the highroad of prosperity and the steam roller of politics is forced into the ditch. In Canada there is only the money stringency to contend with and it is not having any markedly adverse influence on business activity.

It is fully anticipated that the activity of last year in the sanitary and heating trades will be fully maintained.



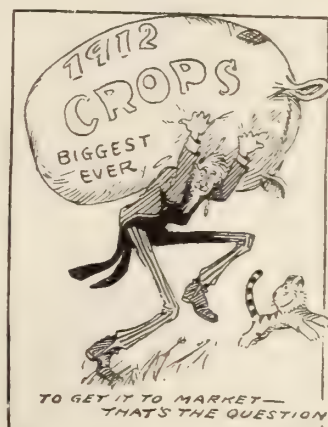
the expansion of legitimate enterprise may be checked. Before going any further into the question, it may here be explained that this contingency is deemed far from likely. While financiers do not anticipate that the situation will be fully relieved this year, they are confident that the banks will continue in a position to accommodate customers and to lend their assistance to all approved measures of expansion. The only certain effect of the money tight-



The Right of Way—Ireland in Columbus Despatch.



Reading a Lesson to the Panic Mongers—McCutcheon.



The Big Problem on Uncle Sam's Hands—Portland Oregonian.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

THE PLUMBERS' EXAMINATION.

Editor, Plumber and Steamfitter,—Do you think that it would be right to make the showing of the work count for 65 per cent. in marking the plumbers' standing on examination, and all of the rest up to 100 to be written examination, 75 per cent. being required for a pass?—Student.

We are not exactly sure on this point. There are some points to be considered that you do not mention. A man who has worked at the trade for 20 or 30 years and who can put in a good plumbing job should not, to our mind, be kept out of a license just because he might fall down on the written part of the examination. For years and years plumbing has been put in, at least in

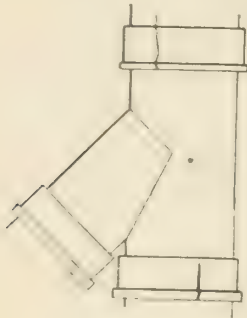


Fig. 1.

some places, by men who were quite illiterate, yet were honest and they did good work. They might have done much better if they possessed a good practical education, but this they were denied. Now, to throw such men out would not, to our mind be a square deal. At the same time we are in favor of education, have been and shall be, but mere education without the ability to execute in a practical manner what one knows would soon put out a class of mechanics who would do a lot of poor work. We have seen this exemplified by some of the students of trade schools. They lacked practical experience, and as soon as they obtained this they were all right. We should be disposed to require at least 75 per cent. in the 100 counts for character. No matter how well posted a plumber may be, or how perfectly he

may be able to do his work, if he is a loafer or is dishonest there ought to be enough counts available to keep him out of the trade and business. Give 30 per cent. for character, 35 per cent. for working ability, and 35 per cent. for the written examination, also taking into consideration the number of years that a man has worked at the business, and the character of the work he has done, and we believe that you have about as fair a make up as can be got at under present conditions. We are always open to "views," however.—D.C.H.

HOW SHOULD THE BRANCH PIPE BE RUN?

Editor, Plumber and Steamfitter,—On a hot water heating job of the ordinary kind where a right angle turn is made, is it better to take off the branch to a radiator before or after the corner has been turned?—Fitter.

We believe that it would depend upon the location of the radiator, and should not fret about the "right angle" turn. Get the water from the boiler to the radiator by the very shortest route and with the fewest number of turns possible. This short route proposition is the main point and not just where the branch may start from the main. Make this a rule in your shop: "Put in the work with the fewest possible turns." You will save time, money, material and have better working jobs.—D. C. H.

AUTOMATIC AIR VALVE DOESN'T SPOUT WATER—WHY DOES A PET COCK?

Editor, Plumber and Steamfitter,—If you put a first-class automatic air valve on a radiator it will get the steam into a radiator all right. Now, put a pet cock on the same radiator and you can draw quarts and quarts from the radiator before it will be all right. Why is this?—M. A. J.

The steam is pushed into the radiator and the pet cock is so made that it provides for the escape of the air and nothing else. So the water (or condensation) comes right along with the air

and will keep coming so until the radiator is hot. Automatic air valves have means provided so that the water will not be allowed to blow out, but must be returned to the inside of the loop of the radiator.—D. C. H.

BALANCED HEAT FROM LOW PRESSURE STEAM JOB.

Editor, Plumber and Steamfitter,—Can you tell me if it is a possible thing to regulate the heat of a low pressure steam job so that all of the rooms in the dwelling will be heated alike?—Curious. Provided that a sufficient amount of



Fig. 2.

radiation is placed in each room the heat can be easily regulated to any even temperature desired in at least two practical ways. First, if you care to do a certain amount of supervising, you can get hold of the very best automatic air valve to be bought and place one on each radiator. Such air valves work quite differently from the ordinary cheap valve used too many times on steam jobs. By a little observation you will be able to so finely adjust them that they will give you any temperature you wish as long as the steam is furnished. Second, buy a reliable temperature regulating apparatus and have it connected to the steam job by a steamfitter that knows his business. This regulator will, automatically, heat each room to the temperature you may desire.

You can heat them all to the same temperature, or you can have different temperatures according to your fancy. These temperature regulators are guaranteed to save time, annoyance, fuel and, therefore, money.—D. C. H.

AVOIDING LEAKS ON VACUUM WORK.

Editor, Plumber and Steamfitter,—How can I avoid having any leaks on putting in a job of vacuum heating.—X.

Nobody can guarantee in advance that you won't. Hire first-class men,

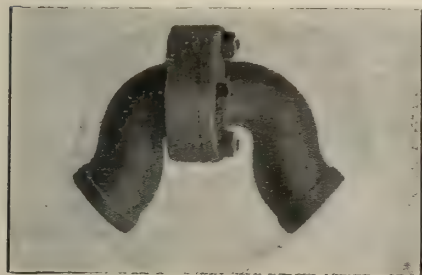


Fig. 3.

furnish them with the best of tools, fittings and pipe; supervise the work yourself, and you will have done about all that one can do.—D. C. H.

SUB-LETTING PLUMBING AND HEATING CONTRACTS.

Editor, Plumber and Steamfitter,—Do you believe that it is a good thing to take a plumbing or heating contract through a general contractor?—Z. I. V.

We believe that there is a diversity of opinion as to the practice among the master plumbers and steamfitters. Many are opposed to the practice, both in this country and the United States, where some of the sub-let contracts have turned out very badly.

At the same time, if the general contractor is fair and the sub-contracting plumber or steamfitter honest, we can conceive of situations where it would be mutually profitable.—D. C. H.

DIFFERENCE BETWEEN HIGH AND LOW PRESSURE STEAM HEAT.

Editor, Plumber and Steamfitter,—Will you be kind enough to explain to me in a general way the difference between high pressure and low pressure steam heating? Where are they used most, and which is better?—Helper.

The low pressure steam heating is used mostly in dwellings, small stores and medium-sized factories. High pressure is used in large plants where the supply may be got from the steam which is generated for power purposes. Strictly speaking, the highest pressure has been mostly discontinued for the exhaust heating or the vacuum manner

of heating which has had a rapid growth for the past five years.

We believe that it has generally been considered that all steam jobs that ran under ten pounds boiler pressure were considered as low pressure jobs, while above ten pounds they were regarded as high pressure jobs.—D. C. H.

PLACING THE GREASE TRAP.

Editor, Plumber and Steamfitter,—I have a grease trap to fit up in connection with a sink in the kitchen. I have enclosed a sketch of the complete fittings. Should the brass fitting be placed between the sink and the grease box, or as I have shown it on the drawing on the drain side?—Walbachin, B.C., "H. I."

Install the grease trap as shown in Figure 5.

LEAKS, THEIR AMOUNT STATED IN BULK.

Editor, Plumber and Steamfitter,—Can you give me any estimate on the amount of water wasted in a town or city through the leaks that are left un-stopped? Any information along this line will be considered a great favor.—Standpipe.

The great city of Chicago is said to be one of the modern mysteries in this respect. It is stated by those who have made it their business to find out that something like 250,000,000 gallons a day of water simply disappears without being accounted for. It costs the city \$2,000 a day to pump this lost water, some 75,000,000 or more gallons of



Fig. 4.

which are lost through the underground pipes. When one considers that there are more than 2,500 miles of water pipe in that city, one can begin to appreciate the task it must be to keep any kind of track of the numerous leaks and breaks in the pipe lines.

Many leaks come from electrolysis of the pipe, the mains and side lines frequently giving away unexpectedly from that cause. The remedy that is suggested for the leaks is to be certain that water meters are installed in each and every building that uses the water.—D. C. H.

BANDING SPLIT FITTING.

Editor, Plumber and Steamfitter,—The "tee" into which the bathroom drain pipes empty in a customer's house is split, as shown in the drawing sent to

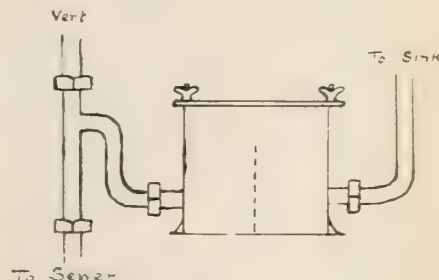


Fig. 5.

you (Figure 1). Do you think that it could be banded and made tight? It will be somewhat of a job to insert another "tee" in its place.—B. M.

We do not believe that you could make a satisfactory job by banding the "tee." Better take it out and not have only your labor for your pains, as you probably would if banding were attempted.—D. C. H.

HOUSING SMALL FITTINGS, WASHERS, ETC.

Editor, Plumber and Steamfitter,—We are fixing over our shop during the winter months, and wish to know if you have any suggestions to make as to how to store up the smallest fittings, ells, gaskets and a hundred other small things that are in the ordinary plumber's shop?—"Methods."

In Figure 2 we show a typical case that we believe might answer your purpose. Its location and labelling will suggest itself to you from your needs.—D. C. H.

A FITTING EASILY SWITCHED.

Editor, Plumber and Steamfitter,—I have some pipe lines to run where it will be necessary to make a number of crooks and turns, and wish to know if you can show any fittings that would help me out?—V. V.

In Figures 3 and 4 we show some fittings that might, perhaps, be of service to you in making the desired turns.—D. C. H.

Benefits From Plumbing Regulations

Wm. Meadows Reads a Highly Interesting Paper Before the Members of the Ontario Society of Domestic, Sanitary and Heating Engineers—Deals in Full With the Necessity of Regulations, Where Regulations Should Begin and How Far-reaching They Should Be—Also the Particular Advantages Derived by the Public Through Enforced Regulations.

The following paper on the "Benefits Derived From Plumbing Regulations" was presented by Wm. Meadows, supervising inspector of the Toronto City Plumbing Department, at the convention of the Ontario Society of Domestic Sanitary and Heating Engineers:—

I think you will agree with me when I say that there should be some kind of plumbing regulations in every city and town, and perhaps village, for if there are any benefits derived from it in one place, there will surely be the same relative advantage in all other places. In this I think we are all of one mind. Perhaps there may be a difference of opinion as to just when these regulations should be put in operation so that the community will derive the most benefit. If it was necessary to pass laws governing plumbers in the earlier years, when concentration of humanity into large cities was not as prevalent as it is to-day, how much more necessary should it be in the present day to start the enforcement of plumbing regulations early in the town's life, and continue it during its growth into a city. If this were done, consider how much defective work would be prevented from being installed. Besides, you would begin to lay the foundation of better work, which you could install later. You would be gradually educating the inhabitants up to the point of having nothing but the best plumbing and drainage, and that done by none but members of the "Ontario Society of Domestic and Heating Engineers." Besides you would be educating all apprentices up to a proper standard, and thereby prevent the "Jack-of-all-trades" coming in from those sections with his lack of knowledge and competing against you. Generally speaking, we consider anything good enough for the country (as it is called) cesspools are located any place, regardless of the consequences. In some cases they percolate into the well used for drinking water, or perhaps they empty into some creek which the cattle are forced to drink from. Plumbing and drainage, and laws pertaining to them, are on the same plane as preventative medicine, and, therefore, cannot be started too early. In other words, you must not let the disease get too strong a hold before you start to eradicate it. Let us look for a moment at what one town claims to have saved by installing sanitary measures.

Mr. Latham, president of the Society of Engineers, of London, England (I make the address of this gentleman plain, so that you will not mistake him for a member of your society), states "That in the town of Croydon they expended \$975,000 in sewage and general sanitary improvements." He then shows figures which prove a saving in the short space of 13 years of \$1,200,000 in the increased efficiency of labor due to these sanitary measures, and concludes in these words—"Although it has been attempted to put a money value on life, we individually feel that life is priceless, and we may look to the 2,439 persons saved from the jaws of death in a single town as the great value of sanitary work. To allow to perish by sanitary neglect is just the same as to take so many people out of their homes and forcibly put them to death, and yet if this were done, the whole nation would revolt at the crime. Yet in how many instances do our local authorities calmly look on while poor innocent victims are condemned to breathe poisoned air, or drink poisoned water? Did you ever stop to think that two-fifths of the deaths are caused by preventable disease—and how much sickness which does not terminate in death is preventable? Dr. Leon Playfair calculates that for every unnecessary death we have 28 cases of unnecessary sickness. Then there is the terrible continuing tax on human life and welfare, falling with immense over-proportion upon the most helpless class of the community—upon the poor and the ignorant, the subordinate and immature, upon classes which in a great part through want of knowledge, and a great part through their dependent position, cannot effectually remonstrate for themselves against the nuisance thus brought upon them, and yet have in their circumstances the strongest of all claims upon a legislature which can justly measure and abate their sufferings.

Here and elsewhere are Boards of Education forming summer schools, conducted in the open air. What for? To try and keep the children who appear predisposed to some of the dreaded diseases from developing them. Let us ask ourselves the plain question: Are we doing our part towards educating the parents to install sanitary plumbing and drainage in the houses which these children will be forced to be closed up

in when they return to their homes? Are we trying to force the powers that be to pass such laws as will protect these children and their parents, or are we aiding the jerry builder to install any kind of poor plumbing and drainage so that he, not us, can make more money out of his sales? Do you ever stop to think that this is close to trafficking in human life? How many of us here have seen the black palled hearse at the door of a house where some shoddy or jerry builder has persuaded us to install defective work, and perhaps we were responsible for that day's mourning? Would it not be a great benefit for us to be able to say, "Well, I know that the plumbing and drainage of that house is not responsible for that death."

After considering these few points, I know that you will all agree with me when I say a plumbing regulation cannot be passed and put into effect too early in the history of any place.

How Far-reaching Should it be?

This point will perhaps give us some trouble to get a satisfactory answer, as there are so many different things to govern it. I think the proper way would be for the Dominion or the Provincial Government to pass a general law, covering all the points in a general way, but made or framed so that there would be no loopholes for the unscrupulous men to crawl through. It should be drawn by a committee of representative men who have no axe to grind. For it is rather funny to hear all the arguments put forward by some individual who has some freaky W. C. bend or coupling, or something of that sort. And should you listen to their stories you would think all others wrong. It should not call for any patented article, or article controlled by one person. It should exclude all that through practice or test have been found faulty. Its clauses should be expressed in common, everyday language, so that the ordinary workman could read and understand it. It should contain a clause or clauses which would insure that only those who understand their calling or trade would be allowed to practice it. This is the most important part of a plumbing regulation. If you can get properly educated men, i.e., educated in the plumbing business, half your battle is over; but when you get men like some of our so-called master plumbers of to-day, men who do not know how to

do the work, and apparently do not want to learn, or are too stupid to learn, you have a dangerous class for the inexperienced builder or owner to deal with. I am happy to say we have but few like this in our city, and they are not members of your society, but we have them, and we have our troubles with them. It is to this class that the unscrupulous man goes, and the inexperienced owner goes to him because he has a license, and thinks that makes the man right, and it is to this class of man the public can generally attribute their bad health, owing to defective plumbing and drainage. If we had our laws arranged properly, the public would not be troubled with him, because he could or should not be allowed in the plumbing and drainage business. In other words, all men who are given a license should first pass an examination sufficiently hard to prove his proficiency. If this were done the public would receive more benefit than we are aware of, and we as plumbers and inspectors would not hear of so much shoddy work.

What particular advantage would the community derive from the passing and enforcing of proper plumbing and drainage regulations? This we have partly answered in the answer to our first question. The community is composed of individuals living together or adjacent to one another, so that the real and perfect welfare of all lies in the welfare of each. We as a community are small wheels, working one into the other, and should one become sick that one is a drag on the others. If we can assist one person by keeping his house healthy, we have benefited the community. If we can keep the community healthy, we have advertised that location and made it attractive to others who want to be healthy, and this is no small number today. The most pertinent question for a careful person is, "Is this place healthy?" "Is this building healthy?" "How is the plumbing and drainage?"

A plumbing and drainage regulation properly enforced gives us a standard which all must attain. Perhaps it is not high enough to suit all, but without it the public are dealing with something which they do not understand, and do not know when they get what they should have to protect their health. A plumbing and drainage regulation is to the community what a foot rule is to the mechanic, or a lb. weight is to the grocer. It tells you how much you get when you ask for so much lumber or tea. Or, if one asks for a lb. of tea, the weight insures him that quantity; or if he asks for plumbing and drainage according to the regulations, be it called by-law, ordinance, or anything else, it

insures him a certain quantity and quality; it assists him to get something which otherwise he would not know what to ask for, and would have to place himself in the hands of others who might not treat him fairly. It should debar all kinds of faulty and freaky fixtures; it should open the field to men of large ideas and progression; it should keep the trade growing and up-to-date, and, therefore, in a healthy state.

Much as we may be shocked at the awful stories we hear of the dreadful conditions which existed in earlier days, when tens of thousands died from unsanitary conditions of the times, we have less reason to be proud of the progress made since those dark days than is generally supposed, because we have been almost criminally neglectful or slow in applying for the general good knowledge which we have since acquired. Mediaeval conditions still exist in some locations among the poor, a rebuke and menace to modern society, because we have not yet learned that the welfare of all lies in the welfare of each. Our ground for congratulation is proportional to our progress in the acceptance of the truth. To this are due our sanitary laws and the aid society gives to these laws. How well the poet Burns has expressed it in his immortal lines:

"Man's inhumanity to man makes
countless thousands mourn."

Should you as individuals expect a personal benefit? I think you should, but you should try and give a fair return for money received. In other words, you should consider what you can do for the community rather than what you can "do the community for." You should be satisfied with a fair return (which you do not always get) for your special qualification. You should not imagine for a moment that you are the only one to be benefited.

Let us directly understand that a plumbing and drainage law, be it drawn or framed by superhuman intelligence (which it never is) cannot be a cure for all, for it can only be drawn to correct existing conditions, and as soon as drawn we commence to change the circumstances; or in other words, try and make it non-applicable. This is one of the reasons why it should be frequently amended so as to keep it up-to-date.

If a regulation will make all your competitors figure on the same quantity and quality as you have to, I think it has benefited the individual, for it has brought the only point of competition down to your ability to purchase goods. But you say the man who does not respect the regulation gets the advantage. Then it is up to you to see that he

does. In other words, notify the inspector where unlawful work is going on. It is only a protection to yourself and the community. Then, again, you have protection against the man who asks you to do wrong. Tell him it is against the law, and see that no other person breaks the law.

It cannot injure a man who wants to do right. It will and does hamper the man who wants to do wrong, and eventually puts him where he belongs—out of business. The man who is in a district which has no regulation cannot figure on what should be put in to make a good job, but has to figure on what he thinks his competitor will put in, and often he is ashamed of his job when he gets finished. Let me give you an example of how it works on the man who is tempted and falls. The other day a city plumber came into the office and told me his experience. It was like this:

Mr. — got me to install a W.C. in his cellar, saying he wanted it done as cheaply as possible, and hinted he did not care how it was done so long as he got the W.C. where he wanted. The plumber, being a kind-hearted sort of an individual, consented to put it in without inspection, and did so; but when he got it finished and took his bill in, the man told him he was going to ask the city inspector if it was done right. Imagine that man's feelings, and imagine the expense he was put to when he had to put about 40 ft. of 3in. cast iron vent and about three days' time on the job before he could ask the city to pass it—imagine if you can his feelings, fearing the city would find it out before he could get a permit and have it inspected, which meant a fine of \$25. But he said, "It is my first and it will be my last." This is how it will act on the man who wants to do wrong.

Now, Mr. Chairman, I think I have talked long enough. I hope I have in some small way brought out some points which will wake us up and make us think, and perhaps help some person from some part to a line of thought which will stir him up to have a regulation passed in the place he comes from, and thereby help the community, for our lives are not worth living if we cannot be of some help to each other.

Thanking you for your patient hearing to my rambling remarks, and hoping your society may be more successful in the future than it has been in the past.

Vote of Thanks.

On the motion of J. R. Haslett and A. E. Gibbons, a hearty vote of thanks was tendered to Mr. Meadows for the highly instructive paper which he had presented.

Technical Education Helps Plumbing

Jas. R. Haslett Shows How Night Classes in Technical Schools Are a Direct Advantage to Boys Learning the Sanitary and Heating Engineering Profession.—The Old Apprentice System Being Replaced by Technical Schools—Illustrations Taken From Work Carried on in London, Ont.

(Continued from last issue.)

Here the students are young men employed in the plumbing and heating shops thus coming in direct contact with practical work. These pupils attend the lectures every Monday evening and are taught technical or theoretical and then practical application. For instance, they learn the composition of air. They see experiments carried on to prove that air has weight, and from this they learn that a ball-cock float does not only have bouyancy because it is full of air, but that it would float better if the air were pumped out leaving only a vacuum. They are thoroughly instructed in what a vacuum is.

The atmospheric pressure of 14.7 lbs. to the sq. inch is also demonstrated by experiments and the knowledge of this is applied to the working of pumps and syphons of all kinds. They are taught specific gravity and that water is 755 times heavier than air.

Experiments are carried on to prove that water is heavier and occupies least space at 39 deg. that it expands 1-10 as the temperature is reduced until it becomes solid ice, and it also expands 1-20 when its temperature is raised from 39 deg. to 212 deg. Fah., or boiling point.

Instruments are there to prove that water boils at 98 deg. Fah., under vacuum, that water when converted into steam occupies a space 1,700 times greater than when water. This information is then applied to different problems introduced in relation to plumbing and heating and when the students thoroughly grasp these principles they have a complete mastery of scores of jobs that would otherwise "floor them."

Shop mathematics are also taught, and simple rules for finding the area of a circle and many irregular objects, are given. In fact anything of useful shop information is here imparted.

We are optimistic enough to believe that the practical work in the shop by day and this kind of instruction given at night provides our young men with great advantages and must bear fruit by raising the standard of our coming mechanics.

From any information I can glean from the Provincial Government report, London has taken the lead in this matter. The Provincial Dept. of Education has provided Industrial Schools at Ber-

lin, Brockville, Collingwood, Galt, Guelph, Hamilton, Stratford, St. Thomas and Toronto. But in the department's report of 1912 we fail to find that anything is being done to improve plumbing and heating in any one of these places. The reason for this is, apparently, because the men engaged in our business are "dead" and have not energy enough to ask for something that the government will give them bountifully and freely. Wake up. Get after your local school board. Tell them you must have this important calling taken care of. In all lines of business it is first and foremost, because the public health so much depends on it.

We, in London, asked in October 1912 for a sanitary and heating engineering department to be opened up, and we were amazed to find the readiness with which our school board was prepared to supply our needs, starting the class on the first of the year. Of course it would be hard to find a more zealous and competent school board than we have in London.

During the coming midsummer we are to have a large room fitted up in such a way that several practical model installations of plumbing and heating may be executed by the pupils under instruction.

It has been my endeavor to enlighten my fellow craftsmen on the advantages to be obtained by their employees attending Industrial Night Schools, where the classes in all kinds of mechanics are presided over by men of many years of shop experience, who know more about the requirements to be provided for, than any school master who has spent all his days within the walls of a school and has had no commercial or industrial experience.

By engaging practical men to carry on this work the education department has eliminated the danger of time being wasted on froth and fluff, and good sound necessary information both practical and theoretical is imparted, hitting the nail on the head without ceremony.

Should this paper be the means of arousing interest in plumbing and heating classes wherever possible, I shall feel amply repaid for my efforts.

Yours in the craft,

JAMES R. HASLETT.

INSPECTED PLANT.

A goodly representation of the delegates at the convention turned out on Saturday morning to make use of the invitation extended by the Standard Sanitary Manufacturing Co. to make a visit to their plant at Lansdowne and Royce Aves. The trip proved of a highly educative character, making great revelations to most who indulged in it.

The whole process of manufacturing enamelware was shown and carefully explained by members of the company right from the master pattern in wood, to the working pattern and through the various stages until finally the finished product in white enamel was reached.

Going through the plant showed the process through which a bath, lavatory, or any other piece of enamelware had to go, and the amount of labor expended on each piece before the finished article was reached.

After having gone all through the factory the general opinion expressed was: "We were under the impression that we were being robbed every time we bought enamelware, now it appears that we get it quite cheap."



PREVENTING SINK TRAP STOPPAGE.

Editor, Plumber and Steamfitter,—How is the best way to prevent the trap on the sink waste pipe from getting stopped up as quickly as they generally do?—J. L.

One way is to run plenty of scalding water through the pipe each day. Another, and a good preventative, is to have a vegetable strainer at one corner of the sink into which all of the scrapings, cuttings, etc., must be placed. This will assist very materially.—D.C.H.



WHAT IS HUMIDITY?

Editor, Plumber and Steamfitter,—I see the word "humidity" frequently in reading your paper. Will you be kind enough to give me an idea of the term?—M. T. O.

The term humidity refers to the condition of the atmosphere with relation to the amount of vapor, or water, that the atmosphere holds in suspension.

For example, say that a room you are heating by steam has a temperature of from 60 to 70. This would require a relative humidity of from 40 to 50 in the winter time.—D. C. H.



Nelson, B.C.—J. C. Kraus, has opened up a sanitary and heating engineers establishment in the Gaw block, Winnipeg, Man.

Neepawa, Man. — The Neepawa Plumbing Co. lately opened up business in the premises vacated by U. J. Barr.

New By-Law Will Prove Hardship to Craft

Toronto Council Puts Through Legislation Which Would Mean Heavy Loss to Members of the Trade in That City—Deputation Protests Against Immediate Carrying Out of New Clauses.

Considerable indignation is being felt by the sanitary engineers of Toronto, against the city council in connection with the new plumbing by-law. Some time ago, this by-law was referred to in Plumber and Steamfitter, the matter under discussion being soil pipe vs. tile pipe for drains under inhabited buildings, stores, factories, etc. The by-law was finally passed on March 18, leaving tile pipe practically on a level with soil pipe for such purposes.

But now there is further cause for expressing indignation. The whole by-law is to go into force on April 15, and only one week's notice has been given. According to the new ruling no slip joints will be allowed on the sewer side of any trap or vent pipe. Or no basin traps, supply pipes to the basin or both with slip joints, such as are now in use will be allowed. Also there is a new ruling with regard to brass fittings to be used. This in plain words means that the plumber after April 15 is not to be allowed to use of these fittings which he has in stock and will simply have to throw them away as so much junk.

On April 11, a committee, composed of L. LeGrow, Wm. Mansell, H. Hicks, and Geo. Clapperton, waited on Dr. Hastings, Medical Health Officer, and asked that he use his influence to have the by-law held off for a term of six months so as to allow plumbers to get rid of stock on hand. This Dr. Hastings agreed to do, but as yet no definite announcement of proceedings has been made.

The clauses of the new by-law dealing with above-mentioned fittings read as follows:—

Clause 43.—(c) No slip or washer joint shall be allowed on sewer side of any trap or on any vent pipe. Trap vents in all cases (W.C.'s excepted), must be taken off discharge side of trap or waste pipe, as shown in diagram—crown venting will not be permitted. No wrought iron vents will be allowed below top of cellar floor, or to be buried under any earth.

Clause 45.—No brass pipe used for waste or vent pipes shall be less than No. 19 Imperial gauge in thickness, and all brass pipe and fittings must be properly tapped and threaded.

Clause 56.—Brass pipes used for water works pressure shall be standard wrought iron sizes and properly threaded. All fittings used for water works pressure must be proper threaded fittings; no slip joints will be allowed.

Further, from the day on which the by-law goes into force, all cast-iron pipe and fittings placed under the ground must be coated with asphaltum or tar applied hot, and all such pipes above ground must be immersed in linseed oil or other such coating to prevent rusting. Clause 31 dealing with this reads:

No cast iron pipe used for drains under ground shall weigh less than the following per length of five feet, and must be coated with asphaltum or tar supplied hot, together with all fittings in drain under ground:

2-inch inside diameter.....	27½ lbs.
3-inch inside diameter.....	47½ lbs.
4-inch inside diameter.....	65 lbs.
5-inch inside diameter.....	85 lbs.
6-inch inside diameter.....	100 lbs.
8-inch inside diameter.....	135 lbs.
9-inch inside diameter.....	167½ lbs.
10-inch inside diameter.....	225 lbs.
12-inch inside diameter.....	270 lbs.

And all pipes, traps, bends or fittings of cast iron shall be of good quality, and shall be free from flaws or defects, and shall be of uniform thickness: untarred pipe and fittings only to be used above ground, which shall be immersed in linseed or other vegetable oil, or other coating which the Medical Officer of Health from time to time may approve of, to prevent them from rusting.

The clauses dealing with soil pipe as compared with tile pipe for drains, read as follows:—

8.—All drains used for sewage or waste under any building shall be of cast-iron, or vitrified salt glazed earthenware drain pipe, and of the kind and weight specified by this by-law.

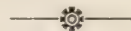
21.—When alterations are made in a building already drained by a tile drain, same may be re-used (provided they are satisfactory to the Medical Officer of Health).

15.—All earthenware drains laid on newly made ground or very wet soil, shall be laid on a prepared foundation of 2-in. pine plank or 4-in. concrete. No built trap or mason's traps shall be used, inside of any building. All traps on earthenware drains shall be of vitrified salt glazed earthenware, and all traps to have hand-holes, and said hand-holes extended to the surface. No inverted joints of any kind will be allowed below any fixture.

Many other minor changes have been made in the new by-law and will effect the plumber more or less directly, but

those given above are of greatest importance.

To ask the plumbers of Toronto to submit to the by-law with only a week's notice is felt by them as unjust in the extreme. It is to be hoped that the time limit will be extended so as to make matters more fair all around.



LOSSES THROUGH CREDIT.

Saskatoon, Sask.—The master plumbers association of this city recently met with the retail merchants association for the purpose of deciding upon some method of overcoming loss through credit.

It is the ultimate plan of the retail merchants association to compile a credit rating book giving the financial standing of debtors of Saskatoon. With the aid of this book the merchant can discriminate between the poor pay customer and the man to whom credit may be given with safety.

The plumbers association will join the retail merchants association in this, both individually and as a body.



MUST INSTALL SANITARY CONVENIENCES.

Toronto, Ont.—City authorities here some time ago launched a campaign to secure the installment of proper sanitary conveniences in all habited buildings. The campaign received considerable impetus recently from the municipal committee of the Legislature when the amendment to the Health Act to permit city authorities, upon an order of the local Board of Health, to install conveniences and make collections by deferred payments was reported. The measure covers the cases where people have not the means to install proper conveniences. Upon introduction, the bill met with smooth sailing, and goes to the House without alteration.



NO MORE DEPOSITS.

Victoria, B.C.—An effort is being made here on the part of the plumbing fraternity to have a by-law passed doing away with the necessity of making a deposit before permission is received to carry on work in the city. Now that the city makes all connections in the street to the property line, plumbers argue that a deposit is no longer necessary.

Keeping Stock in Plumbing Business

Suggestions for Forms to be Used—Much Valuable Information Kept in Cost or Price Book—Stock Book Necessary to Keep Track of Stock Properly And to Advise as to Amount of Goods on Hand—Practical System Throughout.

Editor, Plumber and Steamfitter,—I would be pleased if you could give me an idea of a stock book that would work satisfactorily in a sanitary and heating engineering business.

Yours very truly,

This is a pretty big question to answer in a perfectly satisfactory manner, for a system which has been proved to be highly beneficial in one shop under one master plumber may be found entirely unsatisfactory by a second master plumber. The system given below, however, appears very thorough, and one which should readily be applicable.

The system was originated by the Mills Hardware Co., retail hardware dealers, Hamilton, Ont., but as a system should work out equally well in a plumbing shop as in a hardware store.

A special form is devised for purchasing, so that the firm have the original copy of any order placed with any wholesale house. On receipt of the goods the details of the shipment are entered on a second form, the receiving slip, which is later compared with the

purchasing form to see that order and shipment tally. After purchasing and receiving slips have been checked over and found correct, the goods are then entered into a cost or price book. The cost or price book continues not only original cost of goods and all cost in laying goods down, but also selling price and much valuable information with regard to description and quality of goods and source from which goods were received.

All these three books lead up to a most complete system of keeping track of stock, for which a special stock book has also been prepared. This, with the inventory sheet, renders the system complete.

Descriptions in full of these various forms, with illustrations, are given below.

Purchasing Form.

Figure No. 1 shows the purchasing form made use of by the firm. When making out an order, the buyer takes special care in giving all details, such as shipping instructions, terms, date of shipment, lists, discounts, etc. The

goods entered on the receiving slip are checked from this form. Immediately on the arrival of a shipment, the goods are recorded on the receiving slip and it is compared with the original purchas-

Fig. 5. Showing top sheet of form used in monthly stock book.

ing form. If found correct, the prices of the goods are entered in the cost book from which book the goods are marked. This obviates the necessity of waiting for invoices. These forms measure 8 x 9 1/2 in.

Receiving Slip.

Figure No. 2 gives an illustration of the receiving slip. Immediately upon the arrival of a shipment, the goods are unpacked in the receiving room and entered on these forms by the receiver. This form when filled in contains all information regarding the shipment, such as number of boxes, barrels, etc., freight, express and cartage charges, date, name of transportation company, description of goods, quantities, number and size, and receives signature. As soon as the goods are entered on the sheet it is sent immediately to the office, where it is compared with the original purchasing form, and the quantity is checked up. If shortages are found, they are noted on the receiving slip. The goods are then priced from the cost book and put into stock. The selling price only is marked on the goods. This system does away with the necessity of waiting for the invoice which, in many cases, does not arrive for several days after the receipt of the goods. When the invoice arrives, the quantities are checked from the receiving slip, which shows up any shortages or errors which may have oc-

Fig. 1. Purchasing Form.

curred. The receiving slips are pink in color and measure 7 x 8½ inches.

Cost or Price Book.

Figure No. 3 shows an illustration of the face of a page taken from this cost or price book. Because the cost price is never marked on the goods, it is, therefore, necessary that a very complete cost book be kept. The first column on the page is used for the names of the articles, the second column shows from whom the goods were purchased, the remainder of the columns show—Description of goods, No. or size, list price, discount, cost at factory, cost laid down, selling price. The column at the extreme right of the page shows the reference numbers. You will note that there is a reference number for every line on the page. On the reverse side of the page are duplicate numbers. This side of the page is used for buyer's information regarding goods that are entered in the cost book. In looking up any line of goods in the cost book on which he desires information the buyer refers to the reference number. He then turns the page and on the reverse side he finds a duplicate reference number, opposite which is recorded information, such as, various firms from whom that particular line may be purchased, which make has the best finish, difference in price, and any other remarks that may be of interest to the firm's buyer. Every line of goods entering the store is recorded in the cost book. This is the only record of cost that is kept. All the lines of goods have stock numbers. Cost prices are not marked on the goods. Salesmen are acquainted with selling prices only.

The cost book is in the form of a loose leaf binder, and new sheets may be inserted at any time. The size of the original sheet from which figure 3 was reproduced measures $9\frac{1}{4}$ x 12 inches, and is ruled for 35 lines.

Store Stock Book.

When the stores were first started, the idea was conceived, that, in order to keep stock properly, it was necessary to have a regular stock book whereby it could be found out at any time the quantity of goods in any line that had been disposed of in a given time, also

the amount of stock in any line that was left on hand. With this idea in view, a special loose-leaf stock book was made up. Double pages are used as illustrated in figures 4 and 5. The large or under page as shown in figure 4 measures 12 x 13½. The small page as shown in figure

show that six of the articles were sold during that time, and six remained on hand. This sheet may be used for taking stock every week, month, or as often as desired. When all the lines are filled in, the sheet may be destroyed and a new one inserted. In destroying the

[illegible]

Fig. 2. Form used in the receiving room.

5 measures $4\frac{3}{4} \times 13\frac{1}{2}$. The top sheets contain lists of all the goods carried in stock. Also the name of the firm from whom the goods were purchased, and the names of the articles with numbers and sizes. The bottom sheet, as shown in figure No. 4, also contains list of articles, name, etc., and is used for recording the amount of goods on hand. For instance, on January 1 there were in stock 12 calipers, No. 1 \times 3 in. The stock was taken on February 3, and there were six in stock, which goes to

bottom sheet, the lists of articles are not destroyed, as they have been preserved on the top sheet. A blank bottom sheet may be inserted and the quantities continued from the lists appearing on the top sheet.

Small want books are supplied to each department in the store, and in these books the salesmen make a note of any lines in which the stock is getting low. These books are gone through at regular intervals, and a list is taken of the lines noted. The store

[illegible]

Figure 3. Section of page taken from cost book or price book.

PLUMBER AND STEAMFITTER

stock book is then brought into action and a complete list of the stock of these lines is taken.

This book aids greatly in the prevention of overbuying or overstocking. It also shows up any slow selling lines that have been in stock for too lengthy a period. As all goods in stock are listed in this book, and there is a quantity space for each line, it prevents the sales-

clerk, by whom extended, stock articles, number and size, selling price, cost, extension and double check. The cost price is not marked on the goods. When the calling-off clerk is calling off the stock, he must give the name and number of each line of goods in addition to the quantity. The selling price is also given and entered on the inventory sheet. When the entry clerk has filled

plumber or authorized pipe-layer shall put up bonds in the amount of \$300 for saving harmless the city from all damages by reason of any street being opened during the performance of plumbing work, was made at last night's meeting of the City Council by fifteen local plumbers and firms, who pointed out that, as the city is now installing all sewer, surface drain and water connec-

WHO <i>Blank & Co.</i>		YEAR <i>1913</i> PAGE <i>30.</i>	
	In	Out	
<i>Coolers Inside 18 1 x 3"</i>	12	6	
	4"	12	6
	5"	12	6
	6"	12	6
<i>Bottom Sheet.</i>			

Fig. 4. Section of bottom sheet taken from store stock book.

man from overlooking any goods in stock, which might occur providing no regular system was followed. It also assists the buyer to a great extent in figuring the probable number that will be sold in a certain period of time.

Inventory Sheet.

Figure 6 shows the inventory sheet. The original measures 12 in. x 16 in. When the sheet is filled in, it shows the name of store, calling-off clerk, entry

the sheet it is passed to the office, where the cost prices are obtained from the cost book and entered on the sheet. When the inventory is completed, the sheets are placed in a binder and kept for future reference.

PLUMBERS COMPLAIN.

Protest against the present regulations, which insist that every licensed

tions on the streets between the mains and the property lines, thereby excluding any plumber or sewer contractor from participating in street work, no bond is now necessary. Further, the complaints call attention to what they term the extraordinary powers of the plumbing inspector in the selection of the surety companies. They urge that the offensive clauses be repealed. A special Council committee will investigate the matter.—Victoria Colonist.

February 1st, 191

INVENTORY SHEET

Store _____
Called by _____
Entered by _____
Extended by _____

Stock Location _____
Sheet No. _____

Check	Quantity	ARTICLES	Number and Size	Selling Price	COST	EXTENSION	Check

Figure 6. Showing form used for taking annual inventory.

Tips for Helpers---By "Phoenix"

GROUCHY JOURNEYMEN.

Did it ever occur to you that there are too many journeymen who are possessed of a "chronic grouch?" The woods seems full of them for a fact. Now, in the days that we all had to climb one of the old "windmill" stocks, which had in it solid dies that seemed to cling to the pipe tighter than a brother in distress, there was some cause for a man to get his dander up.

However, to-day, when you can put a thread on a piece of pipe with one hand, whereas in former years it took three good men to turn the trick, there is small room to kick about that point in the game anyway, provided (whisper) one gets the improved tools.

Both steamfitting and plumbing seem to be rather nervous trades, or to put it another way, they are trades that wear upon a person's nerves. So much so that the men get out and into some other line, either masters, estimators, traveling men, or else seem to disappear entirely. Do you often come across an old steamfitter or plumber?—one, say, 50 years old. And yet both trades are well paid, and offer some of the greatest inducements ever found for a man that wants to get out and travel.

When a journeyman gets to that pitch that his nerves go back on him, it is time to get out, or else he will simply go "dippy." I believe that one reason the men get so rattled is that they are about the last gang of men to go to work on a new building. Many of the other trades have got in their work, and are partly, or completely, done. The plumbers and steamfitters come along and must do their work, well aware of all danger; get the work in SOMEHOW, and yet make time, or there will be the Dickens to pay. It would wear upon the nerves of almost any one to know that they were expected to get in ten days' work in seven; yet that is the very proposition that the workman is quite frequently right up against. He starts out by trying to be in two places at the same time, and, as the result, he finally gets all mixed up, the work twisted, and then the grouch descends in full force.

There never yet was anything gained in time or trouble by going at things in a hit or miss fashion, or tackling a job without some well defined idea in the mind of how it was going to be worked

out. I have seen workmen get so foolishly angry at the work and themselves that they would stand and pound the stocks on the pipe with all their might until they ruined the tools. What a senseless proceeding! Instead of just dropping all work for a few moments until the "rattled" spell passed away, they simply made monkeys of themselves.

There was a certain fellow I once met much farther west than Omaha, whom the boys called "Grouchy Mike." This same sardine was always thrusting his mitt at you, like the fellow in the picture, and telling one just how to perform. Take him on any intricate piece of work and he'd go all to pieces. Not



"Grouchy Mike"—Steamfitter.

only that, but he would give the whole gang the "willies" from the manner in which he would carry on. Happened that I saw him cured. The gang gave him the setting hen treatment. Dashed several pails of cold water all over him one day when he got on a rampage and that was the end of Mike's nervous fit on that job at least.

There's plenty of hard work at either branch of the trade and any journeyman simply needs all of the muscle, patience, and good judgment that he is possessed of in order to get by. This allowing one's temper to get the upper hand simply makes a fool of the party that is so weak.

Specialists who have made a study of such matters tell us that every time one goes into one of these crazy fits of anger it knocks a week off the number of days we have to live. Personally, I think that those same specialists were giving us a full run for our money, but such mad fits are sure weakening and disconcerting.

Suppose this:—that you put the very same amount of force that you expend in making an ass of yourself by showing anger over some trivial thing, into an effort to develop your common sense. How much would you progress in the course of, say, three or four years?

Do you think that you would still be a journeyman at the end of that time? Well, I don't. I believe that you would then own the whole shooting match and it's no joke either for it has happened several times in real life.



CHICAGO PUMP CO. CATALOGUE.

The Chicago Pump Co., Chicago, Ill., have just issued and sent out to the trade their latest catalogue. In this are described their full line of automatic electric sewage ejectors and bilge pumps, and also their automatic electric "Little Giant" cellar drainer. Full descriptions of each pump, its purpose and construction, are given, accompanied by many explanatory cuts. The catalogue also contains valuable tables, giving capacities, power, discharge heads, and approximate shipping weights. Altogether the booklet presents a very attractive appearance, as well as being highly instructive. Copies can be had upon application to the Chicago Pump Co.



TRADE NOTES.

Montreal, Que.—James N. Bowell, of Staton & Bowell, plumbers, passed away recently.

Woodstock, Ont.—Pickles & Davidson have dissolved partnership. The business will be continued under the management of J. P. Pickles.

Toronto, Ont.—W. J. McGuire & Co., Ltd., are pleased to announce that R. J. McCauley will remain with them as director and general manager. All business entrusted to them will receive his personal attention.

Some Remarks on District Steam Heating*

By W. J. Kline, of the American District Steam Co.

District steam heating, so called, was first conceived by Birdsall Holly, well known as the inventor of pumping engines and the method of pumping water directly into mains under pressure.

About the year 1876 Mr. Holly made his first experiment of conveying steam through underground pipes. This experiment was not extensive, but the result was a vindication of his theory. Briefly, he extended the supply pipe from his house-heating boiler out into his lawn through a hundred or two feet of pipe, and then, re-entering his house, connected the pipe to his heating system and successfully heated his home. Later, encouraged by his success, he constructed a main from his boiler to another house on the same street, several hundred feet distant. The second demonstration was as successful as the first, and as a result a company was formed, and in 1877 the first extensive system was constructed at Lockport, N.Y., and is in successful operation to-day. However, the original crude construction of the first installation has been replaced in later years with many improvements as a result of the knowledge gained by experiments and tests.

As would be supposed, construction methods in the early days of district heating were largely experimental, and continued to be so until the test of time had shown the inadequacy and unsuitability of the devices first used and the inefficiency and lack of durability of many methods of insulating mains against heat loss. In view of these facts—which were necessarily handicaps to operating companies—the steady progress of district steam heating has been a triumphal demonstration of Mr. Holly's invention.

I shall not at this time attempt to discuss the many experiments which have been made with the object of standardizing the construction of underground heating mains. "Progress" has been the watchword, working toward the ultimate end of

Simplicity,
Durability,
Efficiency.

Simplicity—in eliminating all complicated apparatus.

Durability—by using materials and methods insuring the longest life.

Efficiency—by reducing fixed losses and maintenance charges to a minimum.

In view of a large amount of printed descriptive matter extant, which may be readily obtained, a specific description of materials and methods will be omitted.

Operation.

The development of operating methods has in a measure paralleled the advancement of construction details. Mechanical soundness is a vital factor, but without rational business principles in the operation of a district heating system mediocre results will be obtained.

Boiler room efficiency is, in order, a problem too often neglected, or indifferently studied. Here is the source of heat to be distributed whether in live or exhaust steam, and the expenditure of man's best resources will be amply rewarded. With the vast fund of information available, it is a reflection on any operator who only secures 50 per cent. of the heat units in coal when he should get 60 per cent., or 60 per cent. when he should get 70 per cent., etc. Records, tests and comparisons stop many leaks.

The operation of a combination steam heating plant, one using both exhaust and live steam, presents a further problem in the engine room, which will influence the degree of profit to a considerable extent.

It must be conceded that "back pressure" on engines increases the amount of steam required to develop a horsepower, but has been aptly described as "the most profitable load an engine carries"—when the exhaust steam is sold for heating. It will also be conceded that a unit quantity of steam contains a certain quantity of energy, a greater or less proportion of which may be developed according to the construction and efficiency of what might be termed the "transformer."

A third postulate will also be conceded—that there exists in every community a definite demand for heat, varying according to the changes of temperature, etc., and uninfluenced by other necessities, such as water and light.

Since there is a demand for heat, which is distributed from the central station in the form of steam, it follows that there exists a certain amount of mechanical energy in the total quantity of steam demanded for heating. Therefore, an ideal engine room condition would be the development of the greatest amount of energy possible from the steam needed to supply the heating demand, and with the engine which will

use the least amount of steam per horsepower against the necessary back-pressure. Then when the exhaust steam has been sold for heating the greatest possible heat efficiency of steam will be realized.

It is not profitable to run two engines under back-pressure when one will supply the exhaust steam needed. Therefore, a considerable expense is justified in providing station piping so arranged that the best co-ordination of electric and heating loads possible may be realized. This arrangement is indispensable for the further reason of the fluctuation in the amount of heat required in various months, which ranges from 5 to 6 per cent. of the season's demand in the warmer to several times greater in the coldest months.

Each individual case will vary somewhat, depending upon station equipment and heat demand, but in the main a scheme of operation can be worked out in any plant which will assist toward economy of operation without much expense.

Aside from the generating station and a properly constructed underground distributing system, the district steam heating problem becomes largely one of dealing with the individual consumer, and since steam heating companies seldom have an interruption of service, the commercial feature is one of the principal factors to be considered.

Selling Heat.

The invisibility of heat is its most important distinguishing characteristic and may, therefore, be used and wasted without being particularly noticed by the consumer except so far as his comfort is concerned. This furnishes the key to the problem, which is measured service.

In the early history of district heating several methods of selling heat were used, all of which were lump sums, determined in various ways.

About the first was that of charging a fixed amount for the heating season, equal to the average coal bill.

Again, a fixed sum per square foot radiation installed was charged, which was manifestly unfair, since the ratio of heating surface to space is seldom alike for buildings of the same size, type of construction, glass and wall exposure, etc.

Probably the most equitable of the flat rate methods is that of a fixed charge per unit of space heated; but since the quantity of heat consumed is

*Paper presented at the annual meeting of the National District Heating Association.

influenced by the construction and use of the building, temperament of the individual, etc., even this method cannot fail to work injustice in a very large majority of cases. Tabulated records show a variation of over 100 per cent. in heat used per unit of space in the same cities.

The velocity or live steam meter was the first forward step in the selling of the heat of steam, and many are in use to-day. Their moral effect has been helpful to plants using them, besides furnishing a fairly accurate record of consumption under the proper conditions. Pressure and volume variations which affect the calibration of the meter have been the principal handicaps of this style of meter.

The need of an accurate device to measure the quantity of heat consumed resulted in the invention of the condensation meter and to its subsequent development. The scientific principle upon which it is based is too well known to require discussion, but it should be noted that its accuracy is practically uninfluenced by variations of pressure of the steam entering a building and for the following reasons:

Based on the temperature of steam at 0 pounds pressure gauge, the increase of degrees Fahrenheit at 25 pounds pressure is about 25 pounds, but the total heat of steam at 25 pounds pressure is less than 1½ per cent. greater than the total heat at 0 pounds pressure. Therefore, for all practical purposes each customer receives an equal heat value for each pound of steam condensed. Reference to standard tables of the properties of steam will show the exact variations in quantities.

The condensation meter is now in general use by district steam heating companies and no company will realize its proper success unless it is adopted as a medium for determining charges.

A proper rate is of vital importance to a heating company and should fulfill two conditions:

It should allow the company a fair profit over manufacturing costs.

It should not be burdensome or prohibitive to the consumer, but it should be high enough to discourage extravagance.

Manufacturing costs are made up of two items:

- Generating,
- Fixed charges.

Generating charges vary according to the cost of coal, water and labor, and the evaporative efficiency of the fuel, and may average from 20 to 30 per cent. per 1,000 pounds of steam manufactured, according to locality.

Fixed charges are based on salaries, office expenses, investment, etc., and the amount per 1,000 pounds will vary inversely as the total quantity manufactured during the season. The sum of the foregoing items plus a fair profit should determine the net average rate charged.

For a particular community local conditions should be taken into account in determining what the company must charge and what the customer can afford to pay. In this latter connection it may be said that a customer can afford to pay per 1,000 pounds of steam at least one-tenth of the local cost per ton of anthracite coal, and for this reason:

Fuel burned in small quantities will not produce a high evaporative efficiency and, therefore, on the basis of five to one, 10,000 pounds of steam will be made from a ton of coal, which, I believe, is conservative. This fundamental handicap in individual plants has a further tendency to compel the average individual toward insufficient heating or at least to regulate the supply more nearly to necessity, which he often fails to do when using heat from a district system unless the rate charged is high enough to furnish a motive for economy. Heating companies are often confronted with the statement that their service costs more than the expense when the individual "used to do it himself." The statement would be quite harmless if qualified by the fact that the customer has used a proportionally greater amount of heat.

A sliding scale of charges varying according to quantities consumed seems to be the most desirable, for the larger the consumer the proportionally less his generating expense, and as a matter of business the operating company can afford to take a less profit per 1,000 pounds when large quantities are sold.

Rates should always be based on the manufacturing cost of live steam, independent of the benefits a company may derive through utilizing its exhaust steam. It is true that the profits of exhaust heating are larger than strictly live steam, but the economic principle of demand for heat, and its commercial value, remains unchanged, and the contingency of furnishing live steam should be anticipated.

An operating company should uphold a proper rate and educate the individuals to economy, rather than make concessions in cases of excessive consumption due to carelessness or to fundamental causes, for example poor construction of building, business of occupant, or mechanical defects of the piping system.

Every well-conducted heating system should have a system of accurate records of all departments of the business arranged in convenient form for comparison. Without such records and unless used when kept, progress will remain largely a matter of chance.

Among the items of station records will be included:

- Pounds fuel burned,
- Pounds water evaporated,
- Average daily temperature,
- Average daily wind,
- Average daily relative humidity,
- Average temperature of feed water.
- Daily K.W. output (if combination plant), etc.

Office records will include:

Monthly condensation of each customer, together with an accurate measurement of the space heated, amount of radiating surface, economy coil, size of trap, size of meter, etc.

A graphic representation of some of the information of this character often-times reveals facts which might otherwise be overlooked.

The heating business in general has been considered too easy. This is true of selling as well as of operating. Within a short time a manager said to me: "We never solicit heating business; it comes to us." It seems to me that if the heating business is at all worth while every possible customer should be secured, for the more space heated per foot of mains installed the greater the net profit of operation as the fixed charges are spread over a greater volume.

However, such conditions are rapidly passing away. A great deal of information has been compiled, and with standard construction, reliable meters, equitable rates, the success of the district steam heating is assured, as has been demonstrated by the many companies now operating.



Estevan, Sask.—The Brown Plumbing and Heating Co. expect to start business here during the first week in April.

Winnipeg, Man.—The Hackney Tile and Manufacturing Co. have purchased a site on Higgins Ave. and May St., on which a large warehouse will be erected. The members of the new firm are D. M. Hackney, Winnipeg, with whom will be associated J. G. Ferguson, Sault Ste. Marie, Mich.



It is usually the lazy chap who is too busy for anything extra.

A clerk's value can't be any better than his power of digestion.

Criticisms of a few Plumbing Advertisements

The Use of Illustrations—Never Subscribe to Such Phrases as “Exorbitant Plumbing Bills”—The Ultimatum as a Form of Advertising—Typographical Criticisms.

A few days ago, the writer secured a bundle of clippings containing a number of advertisements of plumbing firms in various parts of Canada. Some were good, some were bad and the majority were just indifferent. A number are reproduced, together with comments upon them. It may be stated that most of those reproduced were selected from the ads. which had been classified as good.

No. 1.—It is always refreshing to find a man who speaks his mind right out. T. G. Sharp is evidently one of the class who believe in calling a spade a spade. His ultimatum—the word seems to apply better in this case than advertisement—is right to the point and leaves no doubts about its meaning. One cannot imagine a slow pay customer going to T. G. Sharp with work after the appearance of this emphatic warning. It is quite apparent that Mr. Sharp has been suffering inconvenience and perhaps loss through the slow pay tactics of customers. Still we think that his warning is given in rather too belligerent a strain. He writes, figuratively speaking, with a chip on his shoulder.

The printer who set this ad up deserved a severe reprimand. The breaks in the border may be due to carelessness or shortage in the supply. Whatever the cause, the advertiser had reason to lodge a most vigorous complaint.

2.—A. E. Law has a neat advertisement, but its effectiveness could have been brightened. For instance, the top headline “any temperature” is inexpressive. It would have been much better if this line had read “hot as you like it,” with the necessary changes in the body of the text to make it read right. Further down one notes the phrase, “no exorbitant plumber bills to pay after we get through.” It is all right to make the point that the advertiser charges fair rates only, but the phrase has been unluckily worded inasmuch as it seems to acknowledge that it is customary for plumber's bills to be exorbitant. This is giving in to a statement which the public is only too willing to accept.

Otherwise, this advertisement is bright and it, no doubt, brought results.

3.—A. D. Cross has a very neatly laid out advertisement. The illustration is perhaps a trifle too large for the total space, but good use has been made of

the space left. The matter is well written and to the point.

Faults to be found in this ad. are almost entirely typographical. The border has not been neatly matched, letters have dropped out of the word “plumbing” and two different series of type have been introduced.

4 and 5.—The Northern Plumbing and Heating Co. have apparently instituted a campaign for repair work. They have hit on a real live topic here. Most people are prone to let things slide without any endeavor to find out if they are suffering thereby. For instance, they do not examine their plumbing appliances and sometimes allow them to go until they approach a condition highly detrimental to the health of the household. These people need “stirring up.” To say that “death lurks in your sinks” is a lurid way of putting it, but the statement is well within the bounds of truth.

It would be a good plan for every sanitary and heating engineer to give the public occasional talks on the subject of adequate inspection and renovation.

6.—A tersely worded homily is that given by David Hall. It tells a truth that has not been found out by the majority of people. Good plumbing is necessary for perfect cleanliness in the household. Therefore, it is necessary for health and happiness. An old truth stated in a new way.

7.—W. J. Kirk has a well planned out advertisement. The illustration is perhaps a little far-fetched, but it is sufficiently “catchy” to attract attention. A wider margin should have been left on both sides of the reading matter. As it is set, it runs so closely to the border on one side and the cut on the other that it is a trifle hard to read and the whole appearance of the ad. suffers. The line above the name of the firm should have been eliminated. It has the effect of cutting the signature off from the body of the ad.

8.—E. K. Strachan has an illustration which will surely catch the eye and thus draw attention to the ad. On close study, however, one is inclined to think that the artist had never seen a bathtub in his life. Presuming the infant to be from 2 to 4 years old, one cannot help but wonder what kind of toy tub we see here depicted. The dimensions surely are “off.”

The reading matter is well written and calculated to rivet the interest.

BATH TUBS AND ANCIENT HISTORY.

Editor Plumber & Steamfitter.—I know that the modern tub for the bath is a thing of joy, but will you please tell me when they first began to make them? I would like a few points on the subject and shall read, with interest, anything that you see fit to publish on the subject. —S.B.K.

The bath tub, itself, is not a new thing for they have been in use, in one form or another for hundreds of years. They date back to the time when the city of Rome was in all of its glory. Pottery on the other hand, goes back much farther in history and the most accurate information seems to show that the glazing of the same originated with the Egyptians. A great variety of pottery both glazed and unglazed was produced. The art, for better or worse came down the centuries and we find that glazed and unglazed pottery was made in Germany as early as the 13th century. There has been found ancient pottery in America and in Peru, in a great variety of shapes. Sometimes this native pottery, made long years before Columbus ever discovered the land, is found to have a thin polish. About 1825 porcelain was first made in the eastern part of the United States. From then to the present day the improvement has been gradual, but sure, until we have arrived at the present stage of development. Articles of porcelain of all kinds and descriptions are now made for the modern bath room of the 20th century.—D.C.H.



GIVE US A SAMPLE SETTING OF A RANGE BOILER.

Editor Plumber & Steamfitter.—Will you be kind enough to run a cut of the hook-up of an ordinary range boiler in an early number of the paper? One that you can bank on for all general occasions.—V.V.

We show, in Fig. 1, an installation that has been found to work in a very satisfactory manner. Please note that there is somewhat of a difference in the hook-up as the lower pipe is straight. It requires a somewhat higher boiler stand. —D.C.H.



Eganville, Ont.—Fleurie Bros., plumbers, have purchased the tinshop and stock of Jas. McDermott.

MAN DOES NOT LIVE BY BREAD ALONE.

But he does need a Little Bread—and in order to
get Bread he must get Paid for
the Work he does.

T. G. SHARP

The Plumber

Wishes to inform the Public that he must have
all Work paid for as soon as performed.

If you need any Plumbing and want to
Pay for it, you can't do better
than Phone 1134

T. G. SHARP,
Plumber, Main St.



Plumbing Repairs

We are a specialty of ours, but re-
pair work is a rare occurrence in
your name or place of business if
We install your plumbing.
We are particular about plumbing
work and use judicious care
in selecting only the most dura-
ble of approved materials for
our work.

A. D. CROSS

West St., north Port Colborne
Telephone 155

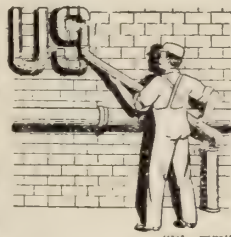
Connect with Us

If you want plumbing of the better
class done. Our estimators are experts
and take the time to show you
with a small quantity of work as when
they install a whole system new.

Plumbing

If you are contemplating building or
alterations, why not consult us and let
us submit estimates.

Our work is satisfactory and our
prices are right.



W. J. BIRK PLUMBER and TINSMITH
Beamsville, Ont



ANY TEMPERATURE

that you may like the water for bath-
ing will be easily obtained by having
us install your plumbing after our
latest improved methods.

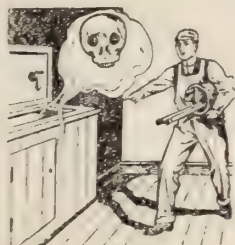
SANITARY and INEXPENSIVE

in every way. No exorbitant plumber
bills to pay after we get through. For
we do the work as it should be done.
Estimates furnished.

A. E. Law

Erie Street, Leamington

Death Lurks In Your Sinks,



Death lurks in your sinks. The best and
most sanitary plumbing is the best and
is constantly kept in repair. No
single day of your time is more
valuable than the day you spend
in your sink. If you are
suffering from a bad sink, we are
here to help you. We are the best
grade of plumbers and our work
is perfect. We are ready to serve
when wanted and charge moderate.

**The Northern Plumbing and
Heating Co.**

Phone 1281

207 Wall St.

Inspect Your Bathroom



Inspect your bathroom to see that there are no
leaking pipes or joints. Examine the
sink and wash basin. Be sure
there is no sewer gas. We must your
plumbing repair work and we know
we can give you the most satisfactory
work for the least money. We take
pains to make our work
work, and we are sure the result
is obtainable.

**THE NORTHERN
PLUMBING and HEATING Co**

Phone 1281.

207 Wall St.



CLEANLINESS.

According to the old pro-
verb, is next to Godliness.
A clean mind and a clean
body contribute greatly to

HEALTH

The greatest single blessing
that we can possibly possess.

HAPPINESS

Is the natural result of
cleanliness and

GOOD PLUMBING
produces all three.

DAVID HALL

Phone 325. 66 Brock St.
Residence 156.

Among Infant Industries



that of Plumbing can scarcely be
classified. But the plumber has to be
seriously concerned about it. When
Plumbing work is being done. We
pay particular attention to sanitary
plumbing in its principles, and have
a reputation for clean and careful
work. We are open to large jobs or
new Plumbing or small ones of other
repairs.

E. K. STRACHAN
Baker Street. Nelson

Teach Customers How to Run Systems

Charles B. Starkey writes in *Domestic Engineering*:—

With the ordinary householder in the Northern climate coal bills are a nightmare, and disagreeable in the extreme. Perhaps a few hints of a practical nature, drawn from experience and observation covering several years, may be of assistance in saving the consumption of an unnecessary amount of coal, and so the following points are given for the benefit of all, but this article has to deal with several points which should be considered.

Many heating jobs are not being run to the best advantage because of the indifference or laziness of those who have them in charge, and also because the jobs are not installed to the best advantage.

The Boiler Too Small.

One very common mistake is to put in a boiler which is too small. The house heating boiler should be capable of carrying anywhere from 35 per cent. to 50 per cent. more radiation than is connected to the system. If this is overlooked the fire will have to be attended to every few hours at an unnecessary expenditure of coal and labor.

Chimney Too Small.

The chimney should be of a size sufficient properly to carry the boiler. This point is many times neglected and the area of the boiler's smoke pipe in square inches is greater than the sectional area of the chimney. Such a job will never work well. The boiler simply cannot generate steam quickly and may never raise steam enough to fill all the radiators. I remember one place where this very point was overlooked, and when the installation was tested out it was found that the boiler could not raise a single pound of steam. The chimney was enlarged at a considerable expense and the job then tested; the result showing that the boiler easily carried a pressure of three pounds which was sufficient to heat the building.

Keep Boiler Clean.

The boiler should be kept free from ashes and soot, as the efficiency of any boiler is reduced materially by not being clean. Do not wait until the gas and smoke fairly drive you from the house. The boiler should be cleaned, as often as once in two or three weeks during the winter season, if the best results are to be obtained.

Run a Deep Banked Fire.

In the ordinary heating boiler a deep banked fire is best from every point of

view. It will hold the steam longer, require less attention and consume less coal.

The writer has proved this many times by measuring out the coal and burning it both ways, viz.: a shallow fire, and a deep banked fire. The coal should be spread evenly and the fire pot filled. When it is fired properly and the gas passed off, bank the fire with cinders, screenings or pea coal. On jobs where no heat controller is used, the dampers should then be nearly closed and the boiler will hold the steam from eight to fourteen hours. This has been tested out and proved too many times to admit of discussion. The reason for an extra damper in the smoke pipe on such a job is that the draft may be too strong and allow too much heat to escape up the chimney which fact is true in many installations in spite of claims to the contrary by various authorities.

Have Boiler Near Chimney.

The boiler should be located as near the chimney as possible. This gives a shorter smoke pipe which is an advantage in many ways. It costs less to replace, is easier to take down, there is less danger from fire, and the chances are greater for a better draft.

Cover All Mains.

The boiler and mains should be properly covered. I have always believed that it is a good practice to brick in the heating boiler with a double wall. To be sure this is an extra expense that many contractors hesitate to figure on when the competition is keen; but I have observed many heating jobs with brick set boilers, and I have generally found that the amount of coal consumed was surprisingly small when the size of the house was considered. When the boiler is set in brick it should be enclosed in a double wall; a hollow space of at least two inches being left between the walls and the top of the boiler covered with plastic asbestos.

Put Radiators Where They Will Have to Work.

The radiators should be placed where they will condense the most steam.

This means that a radiator placed on, or along, an outside wall does better work than if located on the inside wall of the same room.

This point is generally well understood by the trade, but frequently its application is neglected many times through other reasons than the improper arrangement of the rooms, windows or doors.

Burn Right Kind of Fuel.

Both boiler and fuel should be adapted to each other. Do not burn hard coal in a boiler that was constructed to burn soft coal, nor vice versa.

Manufacturers for several years have spent large amounts of money in experimenting and producing boilers to meet different fuel demands, and it is a safe bet that you can not improve upon their results.

Keep Boiler Out of a Pit.

No boiler should be dropped into a pit when it can be avoided. To place a boiler below the cellar level subjects it to the following:—

1. It will, to a certain extent, cut off and reduce the draft.
2. It places the fire in a position where it may be put out by water in the fall and spring of the year if the cellar is partially flooded.
3. It makes extra steps in attending to the fire.
4. In case it is necessary to repair the boiler, it is more difficult to get in a pit, than when upon the floor of the cellar.

Fire Regularly.

A regular hour, both morning and evening, should be established for attending to the fire. Twice a day should be enough for any properly constructed house heating job.

Proportion Radiation Correctly.

A sufficient amount of radiation, only should be used to heat the rooms according to the weather. This means that the wind should be tempered to the shorn lamb, so to speak.

Use But One Radiator in a Room.

It is unnecessary to run two radiators in a room, for an hour or two and then shut down the boiler only a couple of hours later to turn on the drafts when the room grows chilly. The proper way to do is to cut off the extra radiator and run a uniform fire in the boiler which will furnish steam enough only to heat the radiators which may be working. The less the fire is shaken and poked and interfered with, the less coal it will consume.

Temperature Regulators Useful.

This is the point where a temperature regulator is of use as it does away with any adjustment by hand and can be set to perform its work at a wide range of temperatures.

Let One Person Run the Plant.

Nearly every person in the household after the first season is of the opinion that he or she can run the heating plant properly, but the chances are that one

(Continued on page 28.)

Complete Course of Sheet Metal Work

By L. W. KOSER

Now on the Hip line A-B, Fig. 9, draw a common bar the same size and shape as the Common Bar on Fig. 8.

Number each of the points the same and draw lines each way parallel to the line A-B and any distance past the points A and B.

Now drop lines from the points on the ridge, Fig. 8, where the Common Bar intersects same, to lines having the corresponding numbers drawn from the Bar on the Hip line, Fig. 9.

Now drop lines from the points where the Common Bar intersects the Curb, Fig. 8, to the lines having the corre-

sponding numbers on the Hip line, Fig. 9.

Now in front of the ridge, Fig. 8, draw the line J-K and draw light or dotted horizontal lines to this line from each point where the Common Bar intersects the ridge.

Number these lines as shown.

Now transfer the line J-K, Fig. 8, to the front of Fig. 10 as shown by F-H, having the lowest or point 5 even with point T of Fig. 10.

Draw right angle lines from each point on F-H to the line T-W.

Now bring the T square or angle so it runs parallel to the line T-M, Fig. 10,

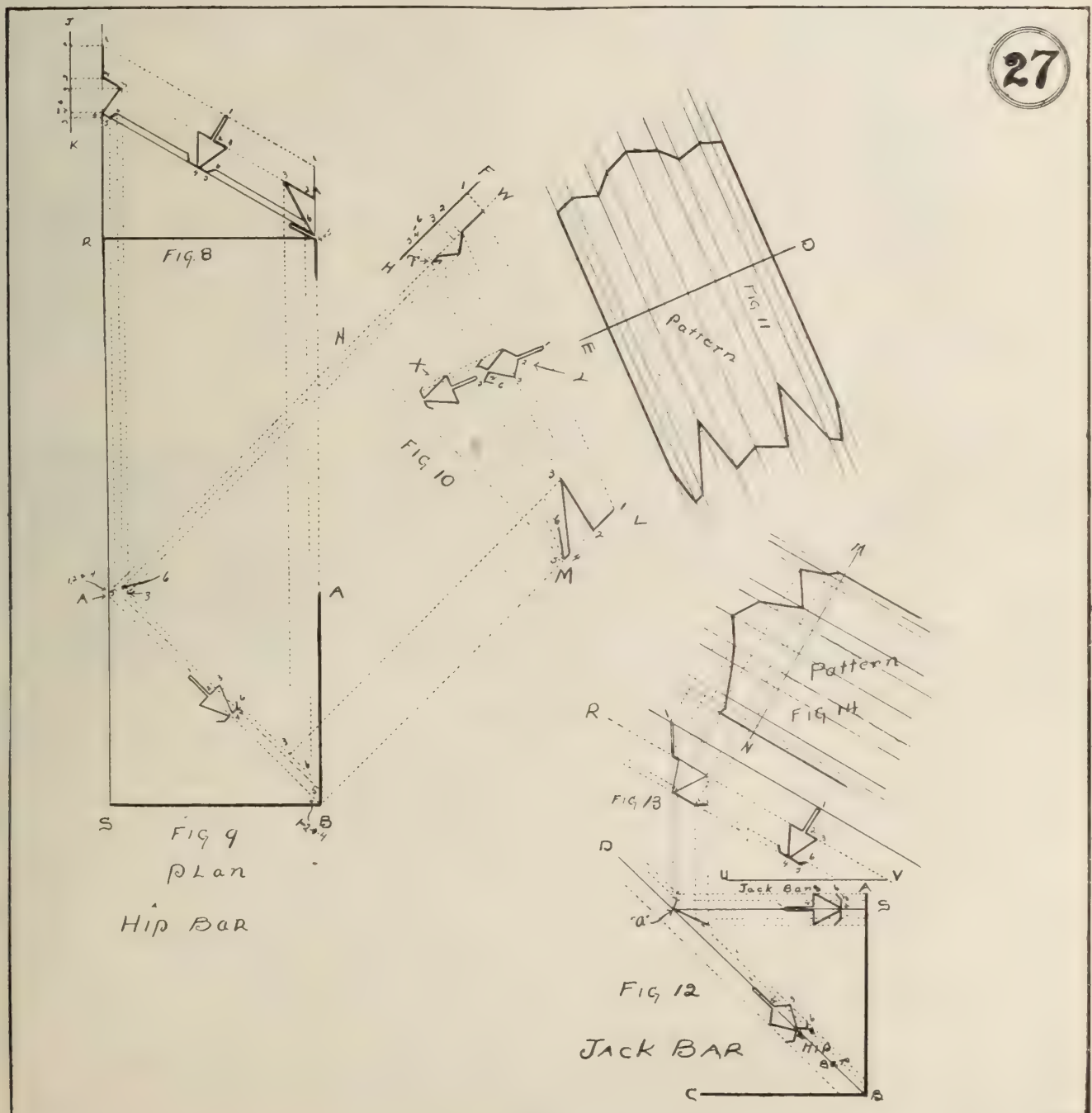
and draw lines from each of its points on the line T-W down past the point M.

Now place the T square angle parallel to the line A-W and carry a line from each of the points at A until they intersect lines having the same number drawn from T-W.

Draw in the profile at T-W. Show by the heavy line which is the profile of the top mitre for the Hip Bar.

Now with the T square at the same angle or parallel to the line B-H carry lines from each of the points at B up to lines having the corresponding numbers at Fig. 10.

(To be continued.)



Plumbing and Heating Markets

MONTREAL.

Montreal, April 15.—Plumbers and steamfitters are kept busy at present figuring the estimates on the plans of the many buildings to be built during the coming season. Few contracts have been let so far, but there is enough in sight now to keep the trade busy for the entire season. The mild weather prevailing here this week will stimulate building operations, and soon the city will be in the midst of the greatest building operations ever seen in this city. The wholesalers report a fair demand for supplies, with a large number of inquiries that will result in much business during the coming season. Prices remain about the same as last reported, and below will be found to-day's quotations:

Iron Pipe Fittings.—Canadian malleable, 40 per cent.; cast iron, 65; standard bushings, 70; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 75; malleable lipped unions, 65.

Soil Pipe and Fittings.—Medium and extra heavy pipe up to 6 inch, 60 per cent.; 7 and 8 in. pipe, 45 per cent.; medium and extra heavy fittings, 70 per cent.; light pipe, 60; fittings, 60 and 5 per cent.

Range Boilers.—30-gallon, standard, \$5.00; extra heavy, \$6.50.

Kitchen Sinks.—Cast iron, 16 x 24, \$1; 18 x 30, \$1.15; 18 x 36, \$1.95; flat rim enameled sinks, 16 x 24, \$2.45; 18 x 30, \$3.00; 18 x 36, \$3.90.

Heating Apparatus.—Hot water boilers, 45 and 15 per cent.; hot water radiators, 42 and 15 per cent.; steam radiators, 44 and 15 per cent.; wall radiators, 37 and 15 per cent.; specials, 25 per cent.

Lead Pipe.—Lead pipe, 7½c, 20 per cent. off; lead waste pipe, 9c, 20 per cent. off; traps and bends, 50 per cent.

Solder, per lb.—Bar, half-and-half, 28½c; Montreal, 30½c; Toronto, 28½c. **Wiping.**—Montreal, 28½c; Toronto, 28c.

Sheet Zinc.—5-cwt. casks—Montreal, \$8.25; Toronto, \$8. Part casks—Montreal, \$8.50; Toronto, \$8.50.

Spelter.—Foreign, per 100 lb.—Montreal, \$7; Toronto, \$7.10.

Tin and Tinplates.—Lamb and Flag and Straits—56 and 28-lb. ingots, 100 lbs.—Montreal, \$54; Toronto, \$54.50.

Wrought iron pipe in black quoted as follows: 3 in. pipe, \$19.47 per 100 feet; 2½ in. pipe, \$14.83 per 100 feet; 2 in. pipe, \$9.30 per 100 feet; 1½ in. pipe, \$6.97 per 100 feet; 1¼ in. pipe, \$5.80 per 100 feet; 1 in. pipe, \$4.27 per 100 feet; ¾ in. pipe, \$2.97 per 100 feet; ½

in. pipe, \$2.57 per 100 feet; ⅜ in. pipe, \$2 per 100 feet (2½ off above prices).

Galvanized wrought iron pipe is selling at: 2 in. galvanized pipe, \$12.80 per 100 ft.; 1½ in. galvanized pipe, \$9.60 per 100 ft.; 1¼ in. galvanized pipe, \$7.98 per 100 ft.; 1 in. galvanized pipe, \$5.87 per 100 ft.; ¾ in. galvanized pipe, \$4.10 per 100 ft.; ½ in. galvanized pipe, \$3.40 per 100 ft. (2½ off above prices).

TORONTO.

Toronto, April 14.—Plumbing markets hold practically same as at last writing, except that an advance has been made in price of 30 gallon boilers. Metal markets hold very firm and show advancing tendency on many lines. Lead shows another advance of 10 cents per 100 pounds; tin is up 1 cent; sheet zinc is up on American markets, and solder shows signs of an early advance.

With opening up of spring building has begun to increase, causing somewhat greater inquiry for all lines of plumbing goods.

Collections are gradually getting back into better shape, but even yet are only fair. Tightness of money has not as yet put much of a damper on building operations, but it is stated that many jobs are being held up, and that within a short time this will curtail orders, especially from the West.

Enamelware.—Market continues firm, but with no change since revision of price lists announced in last issue. Inquiry is fairly brisk, but it is thought by some that tightness of money will soon have depressing effect, although to date the effect has not been marked.

Iron Pipe and Fittings.—Situation remains unchanged. Both black and galvanized pipe are on the market in large quantities, and jobbers are also laying aside a good supply of fittings. Prices held firm at: 1 inch galvanized pipe, \$6.19; 1 inch black pipe, \$4.54; cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bushings, 65 per cent. off; malleable iron bushings, 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—Jobbers are busy ordering supplies of soil pipe and stocking up to meet summer demand. Inquiry from the trade is fairly heavy, and expected to increase in a few weeks. From a manufacturer's standpoint there is "no pipe in sight," as jobbers are snatching it up as soon as turned out from the

factory. Prices are: Medium and heavy, 60 and 5 per cent.; 7 and 7 inch sizes, 45 per cent.

Solder.—Solder holds quite firm. An advance was expected a week ago, but did not materialize. However, an early advance is still looked forward to, owing to the high prices of tin and lead. Easy wiping is quoted at 26; half and half at 30 to 30½, and 40 to 60 at 28½.

Boilers and Radiators.—Manufacturers still find it difficult to turn out enough of the smaller sized radiators, but of the 38 standard plenty are to be had. No scarcity whatever appears in boilers.

Metals.—During the past two weeks the upward tendency in the metal market has shown even increased strength. Prices are moving up and general appearance appears to be one of soundness. Business is reported as quite satisfactory.

Lead has made another advance of 10 cents per 100, and tin is higher by 1 cent per pound. Copper is still quoted at 16 to 16¼ cents in Toronto, but with a heavy trade passing both in spot and future, an advance is expected. Last week copper wire advanced ½ cent per lb. Sheet zinc on the American market has gone up 25 cents per 100, but on the Canadian market has shown no change whatever. Spelter also moved up 10 cents per 100 during past week. Altogether market is very firm.



TEACH CUSTOMERS HOW TO RUN SYSTEM.

(Continued from page 26.)

If two or three are constantly meddling with the fire, the house is cold half of the time, while the coal pile suffers from the frequent demands made upon it.

Don't Throw Coal Away.

On a small job, the amount of coal thrown away uselessly in this manner frequently amounts to two or three tons during the season, which means anywhere from twelve to twenty-four dollars loss through carelessness or ill temper, and also that both the boiler manufacturer and the man who installed it will be blamed for matters which are certainly entirely beyond their control.

Use Common Sense.

So it comes down to a point of using common sense in managing the heating apparatus, and many times when the coal bills amount to a sum unreasonably large, the direct cause is to be found in the carelessness of the man who is supposed to manage the apparatus.



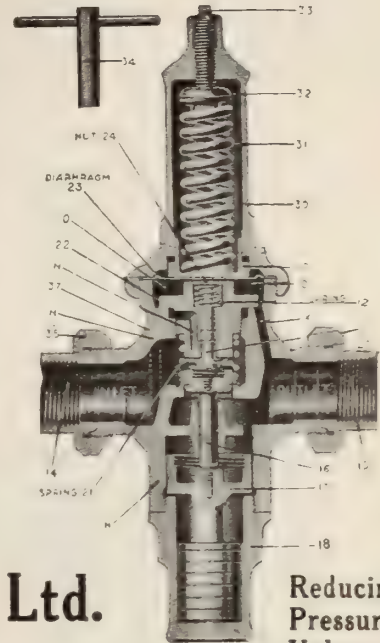
J.M.T. Globe Valve

Valves Of Quality

J.M.T. Valves need no introduction to the experienced steam user. They are accepted as containing the best qualities of a thoroughly efficient Valve for all uses. Made in all the standard Patterns, and in three weights to suit low, medium, and high pressures. They have renewable disc of special composition or hard copper. Offer them to your customer when he wants a GOOD Valve.

J.M.T. Reducing Valve

For service where it is desired to maintain a uniform low pressure off a higher pressure steam line. Largely used for low pressure heating system off the main steam pipe.

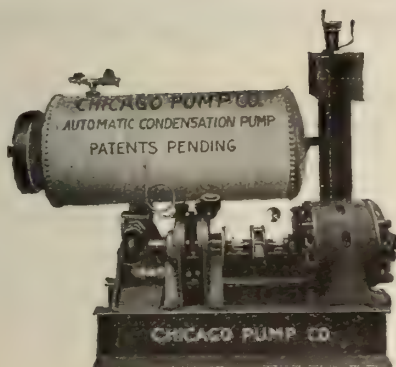


Reducing Pressure Valve

We carry a complete line of Guaranteed Plumbers' and Steamfitters' Supplies. Our prices are right for that of good quality. Your inquiries will receive our prompt attention. Write to-day.

The James Morrison Brass Mfg. Co., Ltd.

93-97 Adelaide St. West. - TORONTO



To Messrs. Plumber, Steamfitter and Company

Gentlemen,—Good circulation in a STEAM HEATING SYSTEM is just as important as good circulation in the human body. When the circulation is bad, tenants get COLD FEET, which is always a bad omen. Chicago Pump Company's Automatic Electric Condensation Pump is the HEART OF THE SYSTEM. It is essential to perfect heating! Perfect heating is essential to paying property!

Never let a man tell you he cannot afford to install our Condensation Pump; the fact is, he cannot afford to be without it. It is far cheaper to pump Condensation water and air out of the system by electricity than it is to carry high steam pressure to force it through the Radiators and return lines. Steam is expensive! Coal and firing—labour are large items!

Our Pump eliminates water hammering in radiators and saves its own cost in one season; if it doesn't we want to know it.

SAVES DIGGING BOILER PITS.

CHICAGO PUMP CO., Chicago, Ill.

Agents wanted. Write for particulars.

Not an Enterprise for the "Quitter"

¶ "If there is one enterprise on earth," says John Wanamaker, "that a 'quitter' should leave severely alone, it is advertising. To make a success of advertising one must be prepared to stick like a barnacle on a boat's bottom.

¶ "He must know before he begins it that he must spend money—lots of it.

¶ "Somebody must tell him that he cannot hope to reap results commensurate with his expenditure early in the game.

¶ "Advertising does not jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year, until it exerts an irresistible power."

BEST YET LIST PRICE \$5.00

**THE "SPRINGFIELD" NEW
MODEL, SELF-CLOSING
NON-SQUIRT**

WHITE PORCELAIN
ENAMELED IRON

NO CUP TO HOLD
FILTHY MATTER

U. S. PAT. DEC. 17, 1912.

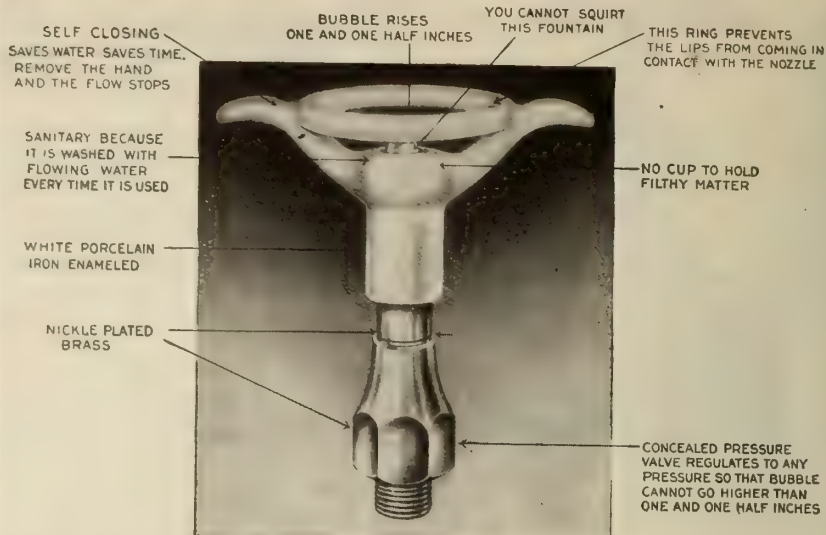
U. S. PAT. FEB. 11, 1911

D. C. PAT. JULY 8, 1911

SPRINGFIELD
—SANITARY DRINKING—
FOUNTAINS

30 CHURCH ST., - NEW YORK
ASK YOUR JOBBER

The Last Word in Drinking Fountains



PEASE IDEAL STEAM BOILERS

PEASE FOUNDRY COMPANY LIMITED TORONTO

PEASE WALDON CO LIMITED WINNIPEG PEASE PACIFIC FOUNDRY LIMITED VANCOUVER

WRITE FOR CATALOGUE & PRICES

Condensed or "Want" Ads.

FOR SALE

FOR SALE—SECOND-HAND SET OF TINSMITH'S machines and tools. Cheap; only used a short time. Apply to The Wm. Beatty Co., Ltd., Farry Sound, Ont. (9)

FOR SALE—BUSINESS OR HALF INTEREST in plumbing and heating company in growing western Ontario city. Splendid opportunity for a live man. Details on application. Apply Box 772, Plumber & Steamfitter, Toronto, Ontario. (8)

FOR SALE ONE TAYLOR-FORBES CAST iron sectional boiler for low pressure heating; used only a short time. Too small for building. Manufacturers' rating 5,000 square feet. For particulars apply to New Brunswick Telephone Company, Limited, St. John, N.B. (11)

FOR SALE PLUMBING AND HEATING business in one of the best towns in western Ontario. Good reasons for selling. Apply to Box 788 Plumber & Steamfitter, Toronto, Ont. (11)

PARTNER WANTED

PRACTICAL TINSMITH WITH \$20,000.00 who can lay out work as partner in an old established plumbing and tin-smithing business in good Ontario town. Sickless and reliable. Apply to Box 788 Plumber & Steamfitter, Toronto, Ont. (16)

SITUATION VACANT

PLUMBER AND STEAMFITTER WANTED—well wages and references. Box 755, Plumber and Steamfitter, Toronto. (8)

WANTED—MAN WITH PRACTICAL EXPERIENCE in plumbing and steamfitting trades. For salary and position and address. Splendid opportunity for man who can qualify. Box 755, Plumber & Steamfitter, Toronto.

SYPHONS
FOR
SEPTIC TANKS

ALLAN POPE - Montreal

MISCELLANEOUS.

ADDING TYPEWRITERS WRITE, ADD OR subtract in one operation. Elliott Fisher, Limited, Room 314 Stair Building, Toronto.

COPELAND - CHATTERSON SYSTEMS — Short, simple. Adapted to all classes of business. The Copeland-Chatterson Company, Limited, Toronto and Ottawa. (tf)

COUNTER CHECK BOOKS—WRITE US to-day for samples. We are manufacturers of the famous Surety Non-Smut Duplicating and Triplicating Counter Check Books and Single Carbon Pads in all varieties. Dominion Register Co., Ltd., Toronto.

COUNTER CHECK BOOKS—ESPECIALLY made for the plumbing and steamfitting trade. Not made by a trust. Send us samples of what you are using—we'll send you right prices. Our holder with patent carbon attachment has no equal on the market. Supplies for binders and monthly account systems. Business Systems, Limited. Manufacturing Stationers, Toronto.

FIRE INSURANCE.—INSURE IN THE Hartford. Agencies everywhere in Canada. (tf)

KAY'S FURNITURE CATALOGUE No. 306 contains 160 pages of fine half-tone engravings of newest designs in carpets, rugs, furniture, draperies, wallpapers and pottery with cash prices. Write for a copy—it's free. John Kay Company, Limited, 36 King St. West, Toronto.

YOU DON'T BUY A NATIONAL CASH Register—it pays for itself. Saves money. Prevents mistakes. We can prove it. National Cash Register Co., 285 Yonge Street, Toronto.



**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE

BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

Books for the Metal Workers

Any of the following books sent prepaid on receipt of price

WRITE FOR CATALOGUE

THE NEW METAL WORKER PATTERN BOOK.

A treatise on pattern cutting as applied to all branches of sheet metal work. By George W. Kirtledge. 430 pages; 774 illustrations; size 10 x 13 inches. Cloth bound. Price \$5.00.

ART OF COPPERSMITHING.

A practical treatise on working sheet copper into all forms. By John Fuller, Sr. 327 pages; 474 engravings; size 10 x 6½ in. Cloth bound. Price \$3.00.

SHEET METAL WORK.

A manual of practical self-instruction in the art of pattern drafting and construction work in light and heavy-gauge metal, including sky-lights and roofing, cornice work, etc. By Wm. Neubecker. 267 pages; 358 illustrations; 6½ x 9¾ inches. Half-Morocco binding. Price \$3.00.

A PRACTICAL WORKSHOP COMPANION.

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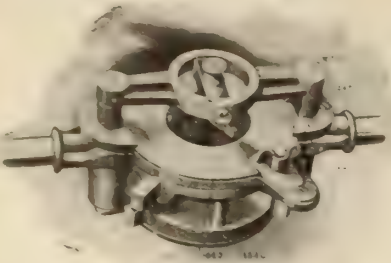
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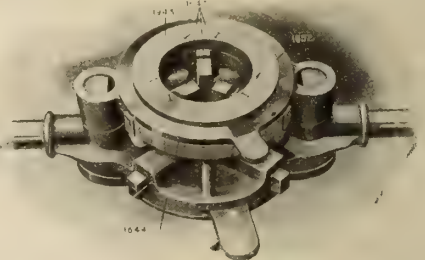
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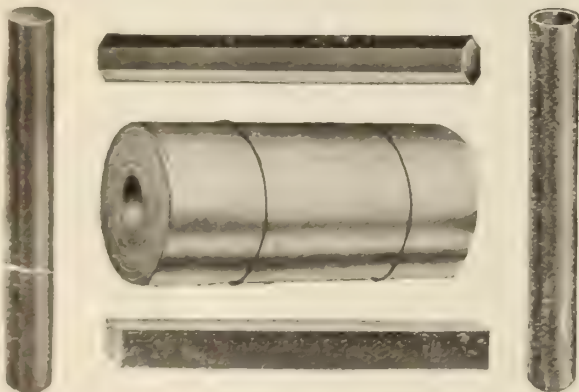
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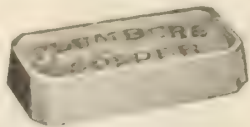
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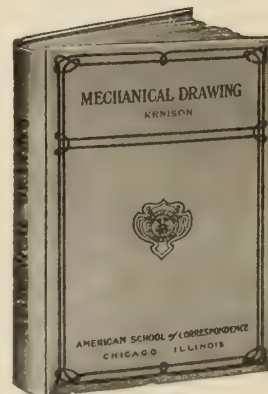
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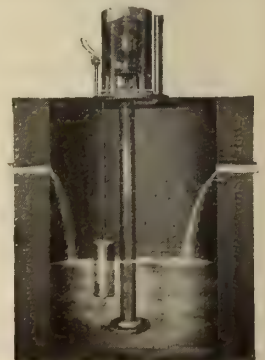
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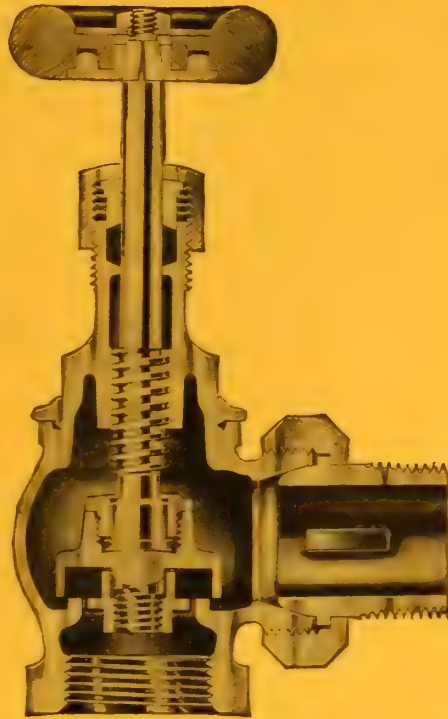
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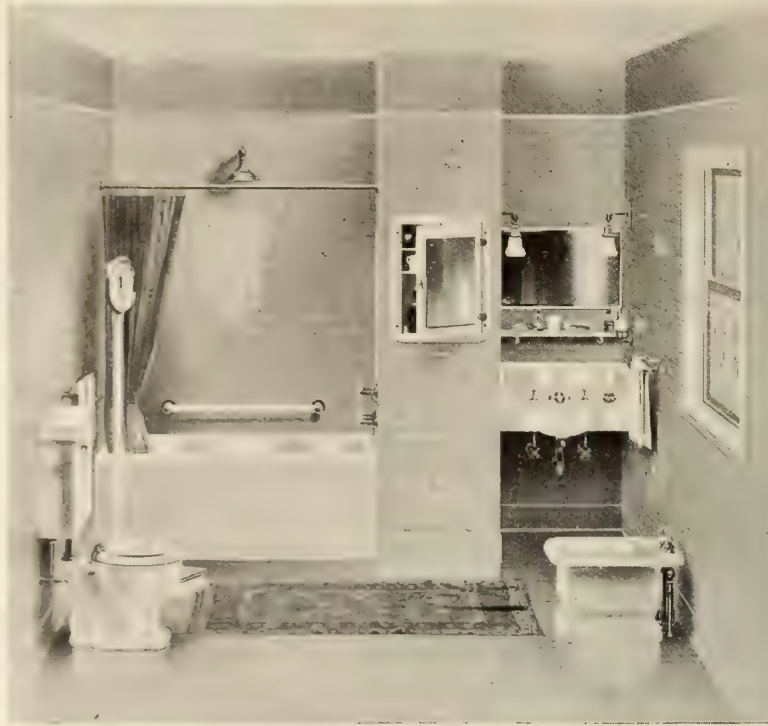
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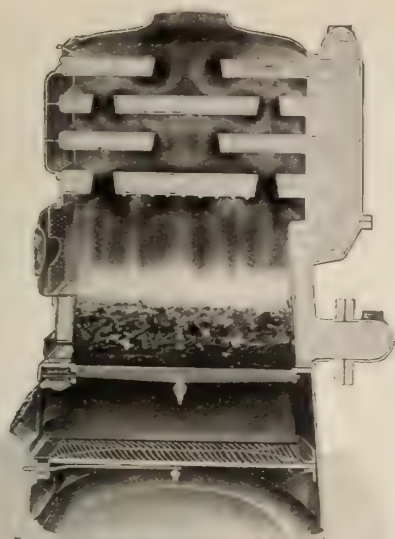
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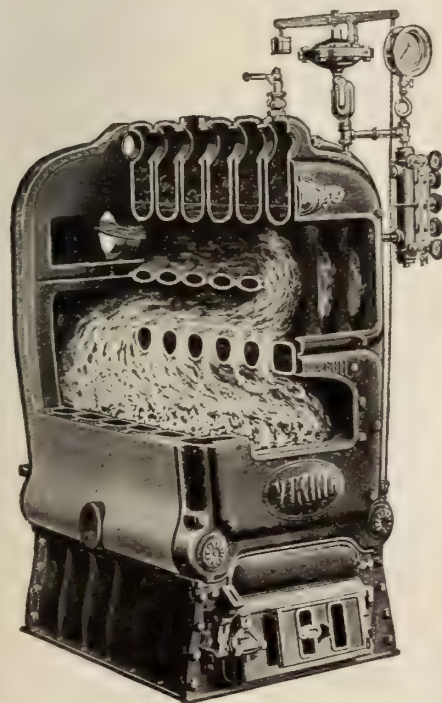


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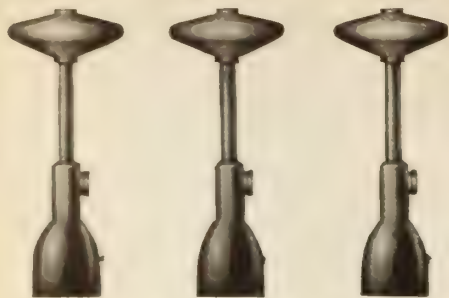
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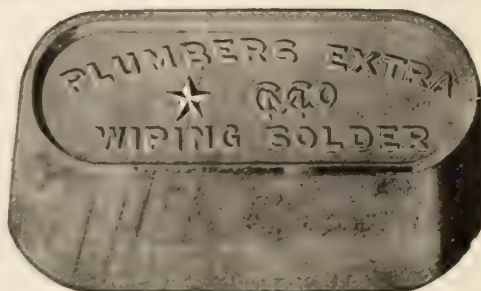
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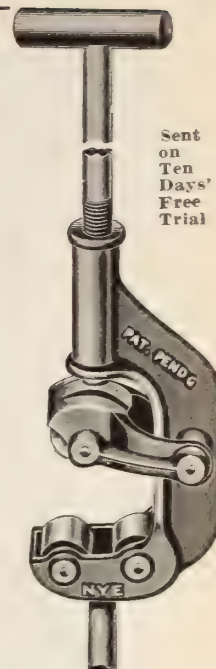
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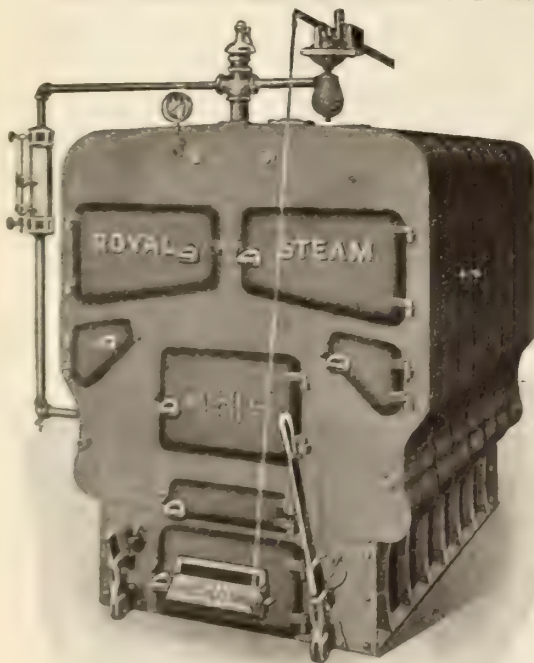
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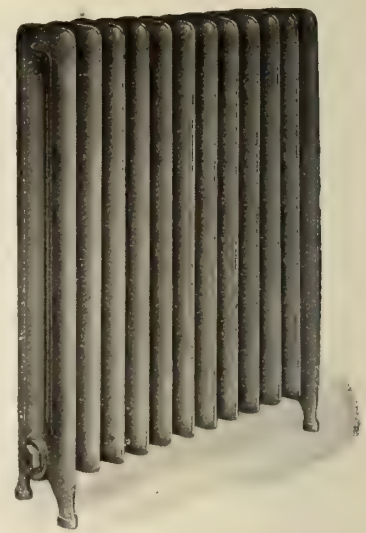


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Representatives from Fort William on the East to Vancouver on the West present at first convention of master plumbers and plumbing inspectors held in Winnipeg, April 16, 17, 18. Insert shows Jas. Smith, chief plumbing inspector of Winnipeg, who presided over the convention and was elected as the first president of the Canadian Institute of Sanitary Engineers.

New Plumbing Code for Western Provinces

Foundation for New Association Firmly Laid at First Convention of Plumbing Inspectors and Sanitary Engineers—Meeting Held in Winnipeg—Draw up Code of Ordinances to be Introduced Throughout Entire West.

The first Convention of Plumbing Inspectors and Sanitary Engineers to be held in Western Canada, has been attended with a very marked degree of success, when considered from any viewpoint. Whether with regard to immediate results or to effects sure to accrue from the deliberations of the delegates assembled in Winnipeg. The importance of this Convention was to be seen, when the list of delegates attending was read. The list included delegates, representatives of all the branches of the plumbing, sanitary and health departments of the various cities and towns concerned, Master Plumbers' Associations, Journeymen's Locals and Supply men, each being well represented, and coming in from all parts, from Fort William and Port Arthur on the east, to Vancouver on the west. All met together unanimously in their desire to create better conditions throughout the entire West. All seemed to realize that their interests were identical and all resolved to do their utmost to ensure success.

The Convention opened on Wednesday a.m., April 16th, in the Industrial Bureau, Winnipeg, Man. The preliminary business of introduction and registration of delegates having been arranged, James Smith, of Winnipeg, was elected chairman and W. McFarlane, secretary (pro tem).

Name Decided for Association.

A committee was formed to consider the name of the new Association and draft constitution. For a name the committee recommended The Canadian Institute of Sanitary Engineers and drew up a constitution using for a model that of the American Institute of Sanitary Engineers. This report was adopted, and after officers had been elected the Convention got down to business.

James Smith was voted to the chair as the man who had been most instrumental in bringing about the convention. W. McFarlane acted as secretary pro tem. Delegates from all parts of the

West met with favor the idea of forming an association.

President James Smith's Address.

In addressing those assembled, Mr. Smith briefly described conditions prevailing throughout the country, pointing out the necessity of organization in order to standardize materials and ordinances. This he claimed would improve sanitary conditions, render the work of the whole plumbing trade more uniform in character and remove many obstacles from the path of all concerned, through enabling manufacturers and agents to hold larger stocks, making competition more open for outside contractors, enabling journeymen plumbers to move freely from one place to another without having to familiarize themselves with an entirely new system. Mr. Smith also dwelt upon the great benefit to be derived by the intelligent administration of plumbing ordinances, and upon the necessity of harmony between members of

the trade and civic officials in order to create an atmosphere of confidence between the trade and the general public. All legislation which they were seeking, he claimed, was directly an aim towards better health conditions and more perfect enjoyment of life.

Jas. Mackie, Winnipeg, spoke, endorsing, on behalf of the Master Plumbers of Winnipeg, the aims and objects of the Association. Mr. Philip, Winnipeg, on behalf of the manufacturers and agents, also commended the ideals of the Association and in the course of his remarks compared the conditions existing in Winnipeg and other outlying points twenty years ago, pointing out the wonderful improvements which had taken place in that time and which showed the good work done by the plumbers and plumbing inspectors of the West. He urged them to keep up the good work, insisting that without good sanitation everything else is of no avail. Thos. Watson, of Regina,

followed with a few remarks in which he dwelt on the friendly feelings existing between plumbers and plumbing inspectors and here also was evidenced the keynote of efficiency combined with economy and the protection of the citizens.

John Wooding, representing the Local Union, followed, striving to impress on the convention the necessity of seeing to it that their inspectors be the best men for the work and claimed for the Winnipeg organization of plumbers, the credit of looking ahead, even as far back as 11 years ago.

The Plumbers Local took up this matter of by-laws and inspections and gathered together a mass of data on the subject and endeavored to have legislation enacted along these lines, but were forced to drop the idea owing to the general apathy of the public in the matter. However, he was proud to give credit where it was due, and congratulated the Convention on their attitude in this matter, promising them the hearty co-operation and support of the trade for an ideal by-law.

Reasons for Convention Stated.

The aims and objects for which they had assembled, were stated shortly:

1. "The forming of an Institute of Sanitary Engineers for Canada.
2. "The consideration and drafting of a uniform 'by-law' or 'plumbing code'.
3. "The standardization of plumbing materials," and the whole tenor of the proceedings indicated in a very emphatic manner the keynote of the convention.

They might very well have taken as their motto: "Efficiency," "Simplicity," and "Economy," with great stress laid on the "Efficiency," for undoubtedly efficiency was the first consideration in all questions arising out of the discussions relating to a uniform by-law. With the idea always before them, that simplicity and ease of construction must

not be neglected in their efforts in this direction, the President and principal speakers continually kept that phase of the question before the Convention, nor did the delegates lose sight of their duty in this matter. The proceedings extended over a period of four days, during which time there was no note struck which suggested any discord. In fact perfect harmony prevailed throughout, although there was considerable diversity of opinion amongst those present on some matters brought up. The various arguments for and against every section of the proposed by-law were presented in a very able and masterly manner.

The papers read covered a variety of subjects. One on "Testing of Plumbing Works", describing the various methods of water, air and smoke tests, was contributed by J. R. Huntback of Edmonton. A paper was read by R. J. Thomas, of Winnipeg, on "house traps." Geo. G. Taylor, of Saskatoon, read a paper on "Drains, Soil and Water Pipes." That presented by W. McFarlane, of Winnipeg, covered "Pipe Terminals" and was of special interest in that it was the result of the writer's own actual and practical experiences in the city of Winnipeg. The points of special importance dealt with were all problems presented in the Prairie Provinces. Among these were the difficulties encountered in dealing with the vent pipe terminals in plumbing works, the means adopted, efforts made to overcome these difficulties and the climatic conditions making the task of providing open roof vents a most difficult problem.

J. McNeill's paper dealt with matter of fixture traps and was well received, coming as it did when the matter of satisfactory fixture traps was under discussion. E. Samson, of Winnipeg, dealt with "vent pipes" in a very able paper, while W. Jones, Moose Jaw, took up the subjects of "local vents" and "bar fixtures." J. Muter gave an interesting

paper on the subject of "sewage ejectors."

As time was short when it came to A. G. Warr's (Prince Albert) paper, he begged permission to hand it in unread. His paper dealt with the subject of "Ram water leaders and back water valves." E. P. Fletcher, of Calgary, gave a fine exposition of his views in the matter of the examination of plumbers. Working along the lines of "education," and "better" education, of all classes engaged in the plumbing trade, he urged his hearers to realize that they were engaged in a very important work. That it was necessary for all of them to remember that to secure recognition of their place in the community they must ever keep before them the watch-word "efficiency" in every phase of their profession.

All these papers were very well received by the Convention and the best thanks of the Convention was extended to the various authors, and all papers were recorded in the minutes of the Convention.

J. R. Morgan, of Vancouver, made a decided break from the course followed throughout the convention by a practical illustration with chalk of his ideas on ventilating, and in a few moments accomplished more than by hours of oratory.

Ed Knechtel, of Saskatoon, showed a thorough knowledge of the subject of local venting and placed his remarks in a forceful, practical manner.

The foregoing gives an idea of the subjects treated and the men who handled them. As an evidence of the interest displayed throughout the various discussions, many delegates, and in particular H. O. Nash and W. C. Ochmpaugh, of Edmonton, showed their determination to "make things go" in their own towns, and make of the association so successfully started, a permanent and profitable organization.

Uniform By-law for the West

Getting right down to business, the convention began with the consideration of a uniform plumbing by-law, and for a working basis took the one now in force in Winnipeg. Beginning at the beginning, each section and clause was considered separately, and where thought not up to standard was changed to meet the general opinion of the convention. In dealing with the various sections, discussion was only once again as deal particularly with questions of interest to the general trade are here given.

Sections thought to deal with matters of an entirely local nature were not entertained, as for a provincial or Dominion law they would be of little value.

Section 12, requiring the work to be inspected, to remain open and uncovered until after inspection, was adopted. In this connection Jno. Wooding drew attention to delays, and stated that a lot of work in new buildings was rushed owing to builders not allowing plumbers the time necessary to get their work in properly. He hoped that the convention

would make this a strict section, and thus encourage better work through allowing no consideration to interfere with their work. This suggestion was heartily adopted.

Spring or Mercury Gauges for Air Tests.

With regard to methods of air tests, E. P. Fletcher, of Calgary, suggested that the test provide for a gauge reading, which should stand for at least 15 minutes without falling off.

J. R. Morgan, of Vancouver, opposed the air test as unreliable, but was of the

opinion that if used the use of the mercury gauge column should be insisted upon in preference to the spring gauge.

J. McNeill, of Winnipeg, quoted experiences where in every case spring gauges had been satisfactory, and pointed out liability of mercury gauges breaking through rough usage.

Finally, decision was given in favor of spring gauges.

Sections 19 and 20, giving inspectors power to examine any plumbing and drainage system and, if satisfactory,

and other features. This was one of the most important matters before the convention—namely, the consideration of the question as to whether the house trap was necessary. Almost every one present had something to say on the matter. Several of the delegates spoke in favor of leaving in a clause (optional) referring to this matter, it being, in their opinion, necessary to provide a house trap; while other delegates spoke in favor of its entire abolition on sanitary and scientific grounds. Jas. Smith was asked to speak on the matter, as Winnipeg had given a great deal of attention to the subject of late years.

Value of the House Trap.

He stated that on account of unsanitary conditions arising from and out of house traps inspectors had decided to abolish house traps in Winnipeg, but owing to great divergence of opinion on the matter, the house trap had remained optional in their by-law for about three years, and, while not prohibiting them entirely, they did not encourage them. He then endeavored to show how the trap question had worked out in Winnipeg. After a number of installations had been put in without the trap, they found that the evils attending the omission of traps were of much greater consequence than those which accompanied the use of them. They found in Winnipeg that there was a difficulty which confronted them—namely, that the currents of air induced by the venting stacks through the houses, caused an equal volume of fresh air, at outside temperature, to enter the sewers through the manhole covers in the streets, and this air flowing through the sewers lowered the temperature, causing the moisture and drainage to freeze over the sewer connection where it entered. They had received a large number of complaints about sewers and drains being choked up, with consequent trouble and annoyance to citizens in their homes. In fact, they had quite a big expense keeping these pipes open in the very cold weather, and it was on this account that they had decided to make it compulsory, that anyone installing a plumbing system after this date should put a house trap in such system. He thought this trap might be absolutely necessary in some circumstances, such, for example, as those they had there in Winnipeg, and in allowing the use of this trap he would demand that precaution should be adopted to prevent any ill-effects occurring from its use. However, he was willing to take the ruling of this convention in the matter, as he thought they should be able to settle the question there if it ever was to be settled.

J. R. Morgan followed, and recommended that the convention cut this

clause and every other clause and section referring to house traps out of the by-law, because he believed the "house trap" to be entirely unnecessary and a source of annoyance and danger. That this convention should not go on record as endorsing the house trap in any shape or form. What did they want a trap for anyway? This bogey of sewer gas was out of date. There was no such thing, and half of the evils credited to sewer gas were due to ignorance of the matter. "Cut the trap out," he said.

House Traps Ruled Out.

After some further discussion, the house trap and all clauses and sections relating to it were eliminated from the by-law. Sections 23, 24 and 25 were taken out, and a committee appointed to

THE ATTENDANCE

Delegates present at the convention who registered are as follows

Fort William, Ont. — W. Coozby, S. McNamara.

Port Arthur, Ont. — J. Becket, J. Sterling.

Moose Jaw, Sask. — W. Jones, J. P. Baylis.

Regina, Sask. — Thomas Watson, Thos. Newis, J. A. Bertwhistle, W. Harvey, W. D. Mathias, J. Adam.

Swift Current, Sask. — E. G. Souton.

Saskatoon, Sask. — Edgor Knechtel, G. C. Taylor.

Prince Albert, Sask. — A. G. Warr.

Calgary, Alta. — E. P. Fletcher, A. L. Milligan, C. E. Good.

Edmonton, Alta. — H. O. Nash, J. R. Huntback, W. C. Ochmpaugh, W. Carse.

Vancouver, B. C. — J. R. Morgan.

St. Boniface, Man. — R. J. Swain, W. Fairley.

Winnipeg, Man. — John Wooding, R. Hefflinger, J. Mackie, S. S. Kennedy, F. Simmons, W. H. Rose, H. E. Clayton, Jas. Smith, W. C. Flavin, W. J. Brick, H. M. Agnew, L. W. White, O. L. Robb, C. H. Chown.

grant certificates to owners, were entertained.

Referring to the number of drains for a double house or terrace, J. McNeill's suggestion that iron pipes only should be used, and that these be continued a separate and independent line from each house, right out to the property line, was adopted.

Is the House Trap Necessary?

Sections 23, 24, 25 and 26 refer to the description of house traps, their location

IMPORTANT RESULTS OF DELIBERATIONS.

Decision given against house traps.

No W. C.'s or urinals in basement of public or semi-public buildings.

Trough closets forbidden; only stall type urinals to be allowed.

All W. C. and urinal compartments to be provided with windows opening to outside air.

Roof caps and terminals shall terminate at highest point of roof and be cut off flush with the roof.

All local vents must be through chimney.

Separate and distinct sewer connections for every house.

Committee of research appointed.

draft a new clause relating to clean-outs on a plumbing system.

Second Day's Business.

Following up the previous day's work, discussion started on the point of catch basin traps. E. P. Fletcher proposed the adoption of a 4-inch water seal instead of such a trap. G. C. Fletcher advocated the adoption of a water seal of at least 4 inches, and recommended a contrivance which he described as a flushometer, with a connection which wasted to the catch basin trap at each flush of the w.c., thus replenishing the seal. The cost, he claimed, was trifling, and service valuable. After much further discussion, the matter was left to the committee, which advocated that

catch basins and traps be optional, but that where used a 4-inch seal must be provided. Carried.

Coating of Pipes.

With regard to coating of house drains, soil waste, and ventilating pipes and stacks, the convention favored galvanizing.

Location of Pipe Terminals at Roof.

Section 38, governing the position of soil, waste and ventilating pipes, and the outlets of vent pipes, their location in roof and height over roof, and section 39 describing and calling for an increaser to be placed on the outlets (4 inches or less), two inches larger diameter specified, and describing the construction of the Winnipeg style of roof cap. These sections gave rise to a highly interesting and instructive discussion of the methods adopted by the different plumbing authorities in the Prairie Provinces, the results of tests and experiments carried out and observations noted in dealing with the question of the freezing over of vent terminals. The matter was discussed with a view to the adoption of some practical scheme to overcome the difficulty.

Jno. Wooding claimed that the solution of the whole problem was to cut down the vertical height and finish the roof terminal about or nearly flush with the roof, and maintained that would certainly mitigate the trouble. His contention was that a large body of metal had more cooling effect than a small one,

and that when we reduce the exposed surface we reduce the amount of ice deposits on the terminal.

R. J. Swain said the City of St. Boniface cut off the terminal at 4 inches above the roof and finds it good practice.

Mr. Wood, Calgary, said they had the same troubles as Winnipeg, and said they found the use of increasers good, but thought the Winnipeg idea was wrong.

H. O. Nash, Edmonton, advocated cutting off the terminal close to the roof and using increasers just inside the roof.

E. P. Fletcher, Calgary, drew attention to the counter-currents set up by the escaping drain air in the vent terminal preventing the warm air condensing on the iron surface. He found that by removing the short projecting pipe over roof and leaving the hub of the pipe to act as an increaser that his own vent stack kept open when most others were frozen over.

J. R. Huntback spoke along the same lines as Mr. Fletcher, and instanced ten 2-inch stacks which terminated at roof line, and which remained open when 1 foot of snow was on the roof. He said the shorter the terminal the better it was. After considerable discussion, the matter was handed over to the committee, who reported that roof caps and terminals should terminate at the highest point of the roof and be cut off flush with the roof. These should be made good with lead flashing.

Clean-outs on Traps.

After much discussion, it was decided that trap screws and clean-outs were unnecessary in any but bath and urinal traps.

Fittings of Heavy Cast Iron.

Section 57 was made to include r.w. pipe, and thus reads: "All fittings for waste, soil and r.w. pipe shall be of heavy cast iron, recessed and threaded drainage fittings, etc."

Wiped Joints Too Vague.

Section 61, referring to joints between lead pipes and lead pipes and ferrules. A. G. Warr said the clause providing for wiped joints was too vague, and wanted to see it made more clear, so as to totally prohibit the use of cup, flange or bolted joints on any running waste or soil pipe. W. Jones supported, and a short discussion followed, in which the definition of "wiped joint" was considered, it being contended that the ordinary flanged joint might be held to be a "wiped" joint. All were unanimous in desiring that improper jointing be prohibited. Finally, it was decided to rule out all cup, flange or bolt joints.

Further amendment was made to this section condemning the use of tapering nipples or ferrules, and allowing to be used only cast brass solder nipples having a recess inside to receive the lead pipe, and provided with a hexagon shoulder.



First officers of the Canadian Institute of Sanitary Engineers elected at the organizing convention held in Winnipeg, Man., on April 14, 17 and 18. Seated at the tables from left to right are—Top Row—H. O. Nash, Edmonton; S. McNamara, Fort William. Second Row—E. Knechtel, Saskatoon; A. G. Warr, Prince Albert; Jno. Wooding, Winnipeg; Thos. Watson, Regina; J. R. Huntback, Edmonton; W. McFarlane, Winnipeg. Front Row—A. J. Beckett, Port Arthur; E. P. Fletcher, Calgary; Jas. Smith, Winnipeg; J. Morgan, Saskatoon.

Trough Closets Ruled Out.

On the motion of J. R. Morgan, of Vancouver, the use of trough closets and latrines was forbidden altogether, not being permissible even in schools or factories.

Local Vent Must be Through Chimney.

Ed. Knichtel introduced the subject of local venting of toilets and bathrooms. Most plumbing ordinances he considered wrong on this subject through either insisting on or leaving optional the placing of vent outlets at ceiling level of the room. He drew attention to the liability of drawing the warm air from the room and leaving the impure and con-

tor, with its consequent liability to freeze up the fixtures and water seals. He condemned it utterly.

J. R. Morgan said daylight and sunlight were more important than air in plumbing works, and this question of local venting was half superstition and half experience. He did not attach much importance to the matter anyhow, for they had regulations on the coast providing for window ventilating of w.c.'s and bathrooms.

Jno. Wooding stated that in Winnipeg they had a climatic condition which demanded some means of venting other than the windows.

W. MacFarlane described how he had found it possible to deliver the discharge through the roof without this freezing up even in the coldest weather. This he accomplished by extending the local vent along the attic and making a long offset in it.

Finally, the convention decided that roof discharge be ruled out, and only chimney connection be allowed.

Question of Lighting Undecided.

With regard to the lighting of w.c. and urinal compartments nothing definite could be decided upon, and the matter was left in the hands of the committee to report at next convention.

Toilet Room in Basement.

The section was adopted reading: "There shall be no w.c.s. or urinals in any basement of a public or semi-public building."

Only Stall Type Urinals Allowed.

J. R. Morgan, dealing with the question of the various types of urinals to be used, stated that the point they had to consider was the sanitary aspect of the case, which, to his mind, was paramount to the question of price. He found that there was no objection in his district to the cost when people knew it was a question of their health which was involved. Urinals, he claimed, might very readily become the most unsanitary fixtures in an installation, and he objected to any but "stall" type. The stall type was adopted in the section by a majority vote.

Trapping Rain Water Leaders.

H. O. Nash did not favor trapping rain water leaders, as by so doing they cut off the venting properties of rain water pipes. He suggested that a pit of gravel met all requirements of the case. Jno. Wooding said that if they cut out the trap they left a means of escape for sewer air to the roof, and they must consider the probable effects on a house with dormer windows. He considered the trap necessary. W. Jones wanted the section adopted as it stood, but Ed. Knechtel was opposed entirely to any

rain water pipes without traps. In his opinion a rain water pipe should not connect to a sanitary drain or sewer. "It is only a make-shift anyhow, and while we must at present, owing to existing conditions, use this make-shift connection, we should take care that it is securely sealed against any danger of escaping gases. The time is near when we shall see this matter of rain water treated in the only proper manner, and which is by constructing storm sewers to take charge of rainfall. I confidently expect to see every city and town construct such sewers very soon. I sincerely hope this convention will leave the trapping in force."

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SANITARY ENGINEERS
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2nd Vice-President — J. R. Morgan, Vancouver, B. C.

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Research Committee—H. D. Mathias, Regina; C. E. Good, Calgary; J. A. Bertwhistle, Regina; S. McNamara, Fort William; Wm. Fairley, St. Boniface; and R. Hefflinger, Winnipeg.

Licensing Master Plumbers.

The question of licensing master plumbers was also discussed, but as this was considered a matter of local nature it was decided to leave it entirely to the local authorities to draft rules, subject to local conditions.

Sizes of Piping.

All questions of sizes of soil and ventilating pipes were left to be settled by a research committee in each inspector's district. Of these committees the inspectors are to be chairmen, and are to report to the institute at next annual meeting.

**WILL MEET NEXT AT
EDMONTON.**

On the motion of W. C. Ochmupagh and H. O. Nash it was decided that the first annual meeting of the Association be held in Edmonton, Alta. In seconding the motion Mr. Nash offered the convention his sincere thanks for all the benefits he had derived from the gathering and on behalf of the master plumbers of Edmonton extended to all a right hearty welcome to come and make theirs the convention city for next year. He promised that they would be right royally entertained and would find most friendly relationship existing between the various branches of the plumbing trade from journeymen up to inspectors both as individuals and unions. This friendly relationship he considered one of the outstanding features of the trade in Edmonton and expressed the wish that next year's convention might go even farther in cementing and extending this relationship.

taminated air to rise to the breathing zone, to the danger and discomfort of the next user of the toilet, and advocated the strict definition of the point of outlet for foul air as being within a distance of 3 feet vertical height from the floor, and as near the fixtures as convenient.

Further, he advised the discharge always being made into a heated flue, such as the chimney of the house. Vents through the roof, he claimed, introduced a danger into a bathroom, as in cold weather the vent pipe changed from a foul air extractor into a cold air jec-

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

JOHN BAYNE MACLEAN, - President
J. G. LORRIMAN, - - - Manager
T. B. COSTAIN
W. S. FARQUHARSON } Editors

Circulating amongst Plumbers, Steam, Hot Water and Gas Fitters, Sanitary Inspectors, Heating and Ventilating Engineers, City Engineers, Boards of Health, Architects, etc.

TORONTO, MAY 1, 1913

The Western Convention

The first convention of Plumbing Inspectors and Sanitary Engineers marks a new era in the history of the trade throughout Western Canada from Fort William to the Coast. Never before was the trade gathered together to discuss matters solely from the standpoint of the West and with an eye towards arranging national uniformity in both ordinances and materials. The step has been a very important one, and coming as it does comparatively early in the development of the West, is likely to be productive of excellent results. Nor will the effect be confined to the Western provinces only. Following their leadership, it is most natural that uniformity should also be brought about throughout the East, and that the enthusiasm aroused at this first convention should permeate throughout the Dominion.

As is thoroughly characteristic with all Western societies, the convention got right down to business. Delegates came there with the idea of forming a national society and of standardizing ordinances in all Western provinces. Taking the Winnipeg plumbing and drainage by-law as a working basis, the convention passed judgment on it clause by clause, making alterations where deemed necessary, until the whole work was completed.

As the main purpose was to make a national law, points dealing with local conditions were left out, to be ruled upon by the various cities as they wished. Questions of national interest, however, were thoroughly discussed so as to finally make the by-law provide for only what had been found best throughout the Dominion.

Lengthy discussion took place on the value of the main house trap. Experiences were given from various districts showing the advantages and disadvantages of this trap until finally decision was given against its use. Other questions, such as location of local vents, styles of urinals, methods of lighting toilet rooms, location of pipe terminals, coating of pipes, trapping rain water leaders, size of piping, and licensing of master plumbers, were also all thoroughly dealt with, so that discussions proved of infinite value to all present.

Undoubtedly, the most important feature of the convention was the bringing together of the trade throughout the West, and the enthusiasm with which the idea of forming of a national association was welcomed. From this out there will be some organized basis to work upon, and somebody to deal with all questions of national importance. This is undoubtedly a decided advantage and, provided interest does not flag, is sure to be productive of splendid results.

The Change in Our Name

With this issue a change in name is made from "Plumber and Steamfitter and Sanitary Engineer of Canada" to "The Sanitary Engineer, Plumber and Steamfitter of Canada." The reasons for the change will be clear to all in the trade. Two years ago, after long consideration, the National Association of Master Plumbers decided to change the name of their body to the Canadian Society of Domestic Sanitary and Heating Engineers. Since that time, the change has been made by practically all provincial and local bodies in existence. Before many years have passed, the title "master plumber" will have become obsolete and in its place will be found the correct designation for members of the trade, "sanitary and heating engineer."

This change in name is justified, nay necessitated, by the changes which have been brought about in the trade itself. The word "plumber" means a worker in lead; and in the early stages this was a correct designation. With the advance of civilization and the perfecting of sanitary appliances, however, the scope of the craft has changed entirely. The sanitary worker to-day must have exhaustive practical training along lines of complex domestic engineering; and in addition, must be equipped with insight into the laws of science and physics. He must understand the natural laws governing heating, ventilation and gravitation. In fact, he has become an engineer in every sense of the word and as such he deserves the title.

In recognition of this fact, the MacLean Publishing Co. have decided to make the change in name as announced above and henceforth we will be "The Sanitary Engineer." There are always great difficulties to be overcome in making a change of this nature, but it was felt that the situation demanded that the official organ of the organized bodies of the trade should be in accord, in title as in everything else, with the advanced legislation adopted.



Arrangements have been completed for the strengthening of the editorial staff. The services of a man, who knows the sanitary business from every angle, has been secured and he will join the organization in a few weeks' time. Under his guidance, "The Sanitary Engineer" will become of greatly increased value to its readers. A definite announcement will be made in next issue.

History of Cast Iron Boilers and Radiation

Introduction of Boilers With Horizontal Sections—Toronto Plays Important Part in Development of Science of Heating—Methods of Successfully Avoiding Boiler Priming—Value of a Surface Blower for Getting Light Grease Off the Boiler.

The second of the series of educational social evenings outlined by the Toronto Society of Domestic Engineers was held on April 17. The main feature of the evening was a paper on the history of cast iron boilers, difficulties presented by same, and how to overcome them. This was compiled and read by H. G. Waterman, of H. G. Waterman & Co., heating engineers, Toronto. Mr. Waterman dealt with the history of boilers and radiation, pointing out in particular the important part which Toronto had played in the development of the science of heating, and also pointed out in a highly practical manner methods of overcoming such difficulties as boiler priming, showing the necessity of blowing off boilers from time to time in order to keep the system clean and in good working order.

Harry Hicks, of the Harry Hicks Co., plumbers and electricians, Toronto, then gave a complete discussion on the workings of the new Toronto plumbing by-law, passed by the City Council on March 18, and to go into force some time within the next six months (date as yet indefinite). Dealing with the by-law clause by clause, Mr. Hicks carefully explained to the members present the difference between the old by-law and the new, pointing out what would be required of them in installing plumbing systems after the enforcement of the new law. As there were many present who came with a rather hazy idea of the workings of the new by-law, the talk given by Mr. Hicks proved highly instructive and beneficial.

The paper as presented by Mr. Waterman on boilers and radiation is given in full as follows:—

To the Toronto Society of Domestic Sanitary and Heating Engineers.

Mr. Chairman and Gentlemen,—It is my intention to give you, gentlemen, a short talk on the history of cast iron boilers, as well as a talk on the possible reasons for trouble with cast iron steam boilers, and how to overcome some of them.

After a good deal of inquiry I find that the first cast iron boiler manufactured on this Continent was a vertical sectional boiler put together with long bolts and rubber washers. This boiler, I believe, originated in the United States, and was used principally for heating churches and assembly halls. This would be about 45 to 50 years ago. About that

time The Hitchings Co. of the United States were making a cast iron boiler for the purpose of heating greenhouses with hot water, and of this boiler there are some still in use at the present time.

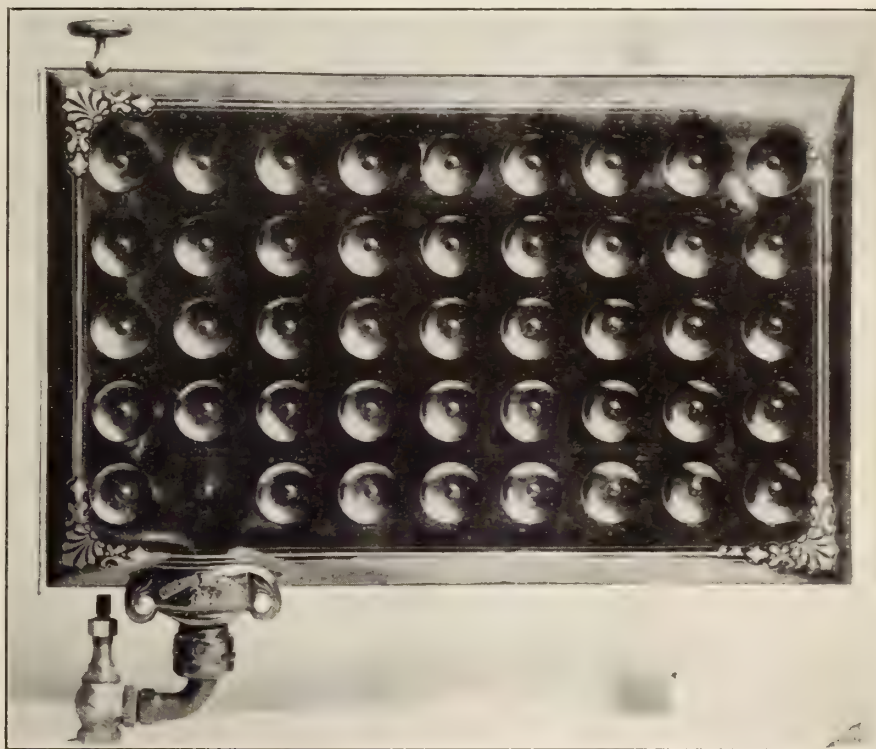
Boilers With Horizontal Sections Introduced.

Then came the cast iron boiler with the horizontal sections placed one upon the other, similar to the modern type of hot water boiler. This boiler was invented by Chas. Sellers (now the father

Mr. Spence made a similar boiler and distributed it through the American firm of Pierce, Butler & Pierce, who manufactured the boilers first, either having bought the patterns outright, or else having arranged a royalty with Mr. Spence.

This boiler, with horizontal sections similar to present makes, was the first ever used for heating dwellings with hot water. Previous to this, as already stated, it was used only for greenhouses.

This line originated right here in To-



Typical type of mattress radiator made in 1854. Name originated from similarity between this radiator and a mattress.

of the Peerless Furnace Co. of Toronto) while in the employ of the Gurney Foundry Co. This was practically the first boiler made for the purpose of heating dwellings with hot water, and was afterwards improved upon, patented and manufactured by Mr. Spence, of Montreal, and subsequently introduced into the United States by the Gurney Co. and Mr. Spence. It is quite safe to claim this boiler as the pioneer of house warming by hot water.

Just here it might be stated that the Gurney Co. at that time had an agency in Boston, Mass., and sold their boilers through the agency. At the same time

ronto, so that Toronto has played an important part in the development of the heating business.

Now, I have a few brief remarks to make in regard to the advantages and disadvantages of cast iron boilers, for steam use in particular. A cast iron steam boiler is a foundry product which can and has been made by manufacturers of radiators and other foundry products without any radical change to their plants.

For instance, one of the largest manufacturers of cast iron boilers and radiators in the world to-day did not make cast iron boilers 12 years ago. So we

learn from this fact that the demand for these boilers has been very great, and that the heating men, as well as the general public in this country and many other countries, have adopted these boilers very readily.

Advantages of Sectional Steam Boilers.

The first advantage of a sectional steam boiler to appeal to a consumer is the saving in installation over the use of a multi-tubular boiler. This saving is not only in the difference of cost of the boilers, but also avoids the necessity of bricking in, and in most cases where the cellar head room is about 7 or 8 feet it avoids the expense of a boiler pit, and perhaps the lowering of the drain or the use of pump or pressure syphon to keep the pit dry. Then, again, it is often necessary to instal a new boiler in an old building, where the existing openings are not large enough to admit a tubular boiler, but will admit the sections of a cast iron boiler without damage to the building.

Causes of Boiler Priming.

When a cast iron sectional steam boiler is installed and the fire is lit and the steam raised for the first time, there is often more or less trouble caused by the boiler priming. This trouble is generally caused by core sand and oil in the boiler, the core sand and some of the grease also being left in by the manufacturer of the boiler, and the majority of the oil getting into the system by oily pipe ends and the too liberal use of red lead or paint in making the joints. Then, again, priming is caused by taking the steam main off only one opening of the boiler, instead of making a header connecting two or three of the openings on the top of the boiler together, and then taking the steam main off a tee in the header.

Methods of Avoiding Priming.

By forming a header in this way the steam gets away from the sections freely, whereas when the steam main is connected to one opening on a seven or eight section boiler, the steam, rushing toward the one opening through the small passages from all sections of the boiler, picks up the water (especially if it is at all dirty), and carries it up the steam main. To watch the water gauge when this action takes place, one would almost believe that the bottom had fallen out of the boiler, the water goes down in the glass so rapidly.

No doubt all of us who have installed sectional boilers have had more or less experience with sections cracking, and it is reasonable to believe that priming is responsible for some of the trouble.

A good sized wet return helps to steady the water line on account of these

boilers containing very little water. This wet return acts as a reservoir, and when priming takes place the water so stored will rush into the boiler, and, as it is cooler than the water in the boiler, it will stop the rapid steaming and give the water carried away by the steam a chance to return.

Another remedy is the connecting of a good sized equalizing pipe near the boiler taken from the bottom of the possible into the main return pipe.

Cleanse System by Blowing Off Boiler.

Then, again, there is the necessity of thoroughly cleansing the system. This can be accomplished by blowing the boiler off both from the surface and from the bottom. Procure some sal soda (three or four pounds, more or less, to suit the size of the boiler). Dissolve this soda in a pail of warm water. Then after seeing that there is no steam on, remove the safety valve and pour in the solution. As there is no surface blow off or waterline opening provided on a cast iron boiler the safety valve opening is the next best place to blow from. This can be conveniently accomplished by putting a short nipple and elbow in place of safety valve and run a piece of pipe to a convenient place for the water to fall. Keep this horizontal pipe about level or with a slight fall to the open elbow. Do not put a piece of pipe in this open elbow to carry it too near the floor level as this may cause a syphon.

Then fill the boiler with water to normal point close to the main valves, if there are any, and start a wood fire, not too strong at first. As soon as the water starts to boil add more water until it boils out of the pipe already mentioned. You can then keep on adding fire and water until all the surface dirt in the boiler has been removed. When you think this has been accomplished, open the fire door and cool down the boiler sufficiently to remove the surface blow off pipe. Put the safety valve back in place and give the boiler a good blow from the bottom blow off, letting the wood fire die out as the water leaves the boiler. If this process is carried out a few times, the danger of priming caused by dirt will be overcome, providing the original source of water is good.

Blow Off Boiler Once a Year.

A boiler for low pressure heating purposes should be blown out in this manner at least once every year, as there is always a collection of rust and sediment in the boiler. A cast iron sectional boiler will sometimes split, in spite of all these precautions. This I believe is due to uneven expansion, caused by uneven temperatures and uneven thicknesses of the castings.

Regarding the ratings of these boilers it has proven a wise plan to use a boiler with double the rated capacity of radiation it has to heat. For example, if your job requires 1,500 feet of radiation use a 3,000 ft. boiler, or in other words double your radiation for your boiler rating, and where you have a good chimney this will insure a nice working job, as far as the boiler capacity is concerned.

The size and height of a chimney is a very important factor in the working of any heating system, and every heating engineer should look into this point with the architect or builder so as to avoid any chimney trouble after the job is completed. No doubt, most of you have had chimney troubles before, or boiler troubles that the manufacturer is always ready to blame upon a faulty chimney. The boiler should be so placed in the basement as to allow the smoke pipe to run direct to the chimney and avoid as many elbows as possible.

In conclusion I would like to make a few statements regarding the progress made in the improvement of radiation.

Development of Radiation.

The illustration I have is a photograph of a steam radiator, called the mattress radiator, owing to its resemblance to a mattress. This radiator was made of sheet metal riveted through, similar to the buttons on a mattress, and was used for steam heating. For ornamentation the users used to have scenes painted on them so that they looked like a framed picture. Following this came the Mason Radiator for steam only, this was made by screwing one inch pipes into a cast iron base the ends of the pipes being welded over.

No doubt, most of the members present have seen these as there are some still in use in Toronto.

After this came the Bundy radiator, this was made of cast iron loops screwed into a cast iron base for steam use only and up to this time made in the U.S. until a Toronto concern procured some of the loops and converted them so that they could be used for hot water.

Then Mr. Safford (a Yankee, though strange to say while in Toronto), invented the Safford radiator. This was the first cast iron radiator with sections connected one to the other ever used for both steam and water.

While Mr. Safford had his radiator of this type on the market first there was another concern working along the same lines, but were a little behind Mr. Safford in placing their goods on the market.

So you see, we the citizens of Toronto can be proud of our city as having been the birth-place of many important developments in the heating business of to-day.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

PREVENTING FLOODED STEAM MAINS.

Editor, Plumber and Steamfitter.—A good-sized steam job installed last winter seems to heat all right, but at certain times, when it was desired to get

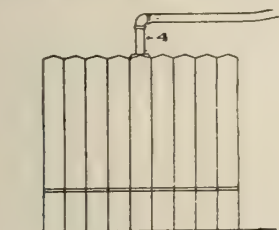


Fig. 1.

up the pressure rapidly, the steam mains filled with water. I hooked the boiler up with only one outlet. Do you suppose that was what was the matter?—S. Gaines.

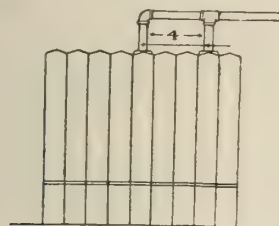


Fig. 2.

We believe that you have struck the key note all right. By reducing the steam outlet you have increased the velocity of the steam and rendered the water line shaky and unreliable. It is

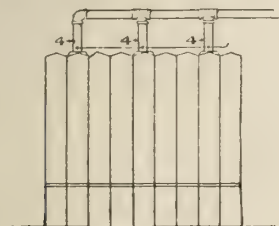


Fig. 3.

not good sense to throw all the burden on one outlet. Take Fig. 1 in the illustration. Here you will have a velocity of some 45 feet per second (on a 4-inch main) and it is stated that by using two outlets, as shown in Fig. 2, the velocity

will be reduced to just one half, while by using all three steam outlets, as shown in Fig. 3 the velocity will be reduced to 15 feet per second for each outlet. Connect the boiler according to Fig. 3, and do not "bush" the outlets. —D.C.H.

TREAT THE PUBLIC TO AN ADVERTISING COURSE.

Editor, Plumber and Steamfitter. — Which would you advise for a man that can spend only a moderate amount of money each season for the purpose; a lot of pamphlets mailed out to certain individuals, or to advertise in the home newspaper with reference to plumbing and heating?—Moderate.

We don't go very strong on the pamphlet idea. If confined to such a course we should prefer to write a series of personal letters. Perhaps we would not reach so many people, but we believe that the cash results would be better. We are in favor of newspaper advertising, not because that we are in the paper business ourselves, but because that we know of so many cases where the results have been excellent. One of the greatest drawbacks has been that the ads. were not written in a manner to give the right result. To merely say "First Class Heating" or "All Heating" jobs (or plumbing jobs) guaranteed, expresses nothing to the customer. In this advanced day and age he expects that. Suppose that you said, "heating that runs itself," you would put the readers mind into an inquiring state and he probably would investigate; or to a man who was building apartments to rent, "heating that brings high class tenants." We have plenty of points both interesting and instructive in both lines of business that we can make advertising talks about, that will tend to draw trade. Take some time and think up a bunch, advertise them and you will be surprised at the results.—D.C.H.

RUNNING THE STEAM MAIN IN MADE OVER HOME.

Editor, Plumber and Steamfitter. — I saw a plan of a house that was made over for modern use and am sending

it to you for a suggestion as to how the steam mains might be run in order to do a good job with the least amount of pipe practicable? See Fig. 4.—J.W.

We believe that we should set the boiler under the dining room connecting the stack of the old-fashioned chimney shown. The fire places would have to be blocked while the steam job was running. Run a loop main under the kitchen and laundry. The drying room can be taken off on a branch. The library and living room can each be taken off on a single branch from the

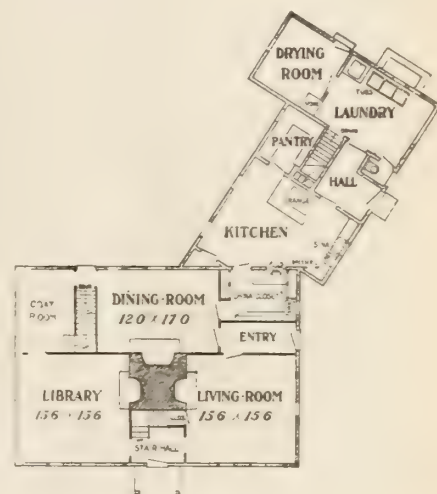


Fig. 4.

boiler, this same branch in each case supplying the rooms above said library and living room.—D.C.H.

PIN HOLE LEAKS.

Editor, Plumber and Steamfitter. — Have you ever got hold of any pointers on the amount of water that would pass through a leak in a water pipe in any certain amount of time? If so, I should be glad to know.—James Q. Renolds.

We observed a statement the other day of where some experiments had been made along this line and it had been found out that a hole in a water pipe about the size of a common pin would, at a pressure of from 40 to 50 pounds, allow nearly 1,000 gallons of water to escape in the course of 24 hours. This is a strong point to urge in an argu-

ment against an excessive waste of water either by individual plants or upon the part of corporations. The smallest leak should be attended to at once when it shows up not only to save the public water supply, but in order to save damages on the premises.—D.C.H.

DAMAGES ON A "BUM" REPAIR JOB.

Editor, Plumber and Steamfitter. — Some time ago the lead pipe which drains my bath tub, got stopped up. A plumber that came to fix it was unable to clear the pipe and so he ripped up the floor, cut a hole in the pipe and finally got it cleared. Then he (I supposed) mended the pipe, replaced the flooring and left. Now a few days ago the pipe stopped up again and another plumber came and got it clear by using some kind of a pump. Then he left. The next time the tub was used a leak in the waste pipe under the floor ruined the ceiling of the lower room. An examination proved that the first plumber had merely wound some tape around the hole he cut in the pipe and left the job in such shape. The second plumber's pump had exerted a pressure on the tape and made it loose, hence the leak. Now can I collect damages from the master who hired the first journeyman plumber?—"Hot One."

If you could prove that the journeyman had orders to make repairs in that way you could. However we do not believe that there is a single master plumber in the Dominion that would countenance such a "bum" job for an instant, if he knew it. The difficulty is that, on a small job like yours the journeyman plumber gets the job done before the master has a chance to see it. Again it might have been a mere "floater" who did the job. If he is still at work there his license ought to be revoked, for a time at least, until he would promise to cut no more such capers. Undoubtedly if you explain the matter to the master he will be glad to make some amends in the matter as no first-class master cares to have such a report in regard to the work of his shop, although, as we have remarked he may be perfectly innocent in the matter.—D.C.H.

AVOIDING CRACKED CLOSET BOWLS.

Editor, Plumber and Steamfitter. — We have recently had occasion to replace several closet bowls that had been set directly on cement floors. In these cases the bowls were cracked in every case when set. Can you give us any information on the subject?—B.&O. Co.

We should consider that the bowls were set too solidly and that the break-

age came from the expansion of the cement as we have found that the cement does expand to an extent of enough for this purpose. Would suggest that you set closets (where they are on cement) so that there will be an allowance for a slight expansion, and we believe that you will not be again troubled in this respect.—D.C.H.

MAKING THE CEMENT FOR TILE JOINTS.

Editor, Plumber and Steamfitter. — Will you be kind enough to tell me the best kind of cement to use on tile joints for a sewer pipe?—"Sewer Joints."

First-class Portland cement mixed with good, clean sharp sand is a good article to use for the purpose. Mix in the proportion of two shovels of the cement to each three shovels of the sand. The resulting mixture should be neither too dry nor too wet when it is used. If it is too dry, it will shrink and leave some cracks from which the water can escape. If too wet, it will slide out at the bottom of the joint and thus make an imperfect job of it. After a little practice one can tell, by the feel of the cement just when it is right.—D.C.H.

WHERE VITRIFIED SEWER PIPE IS BETTER.

Editor, Plumber and Steamfitter. — I have seen it stated that in certain kinds of manufacturers works it was not a good plan to use iron sewer pipes, but do not think that I noticed it stated just the kinds of works where such pipes ought not to be used. Will you be kind enough to state some of them?—T.F.S.

We are informed by one who has had much experience in such matters that iron piping does not give the best results for sewers in soda works, printing works and certain textile works.—D.C.H.

SHINING UP LEAD PIPE.

Editor, Plumber and Steamfitter. — Sometimes we wish to make an old lead pipe look bright. If you know of any manner in which this can be done without too much trouble, I wish that you would publish it.—C.L.H.

First take a cloth and wipe the lead pipe clean. Get down to the body of the lead. Next rub the pipe with a piece of fine emery or sand paper, one that has been used some will be better for it will not scratch the lead any. With the proper amount of work the old lead pipe will come out bright and shiny after being so rubbed. To keep it so give it,

last of all a couple of coats of shellac.—D.C.H.

GETTING THE WHITE LEAD OUT OF THE SYSTEM.

Editor, Plumber and Steamfitter. — On a job of plumbing done but a short time ago the plumber I had put a lot of white lead into the pipe joints and now the owner is putting up a terrible howl about the lead getting into the sink, the tub, the lavatory, etc., every time they draw water from a faucet. How can I get the white lead out of the pipes quickly?—A.Y.

The hot water pipes will soften up the lead and it will be cleaned out of the pipes in a few days. If it comes out at the faucet too strong tie a rag over the faucet and the lead will be strained from the water. Cold water pipes will give more trouble. If you can reverse the circulation for a few hours you will pretty well clear up the situation.—D.C.H.

ADVERTISING PAYS.

Editor, Plumber and Steamfitter. — Have you got any exact figures from any one as to the amount of extra cash that one can figure on if they run a good "ad." in the papers for the plumbing business?—D. & A.

We have not, right off the reel. We presume that we can get access to some of our plumber friend's books and get an average, but pending that time we wish to relate an incident that we observed in an exchange and which we are only too glad to reprint. Here it is, "When a duck lays an egg she just waddles off as if nothing had happened. When a hen lays an egg there's a whale of a noise. The hen advertises. Hence the demand for hen's eggs instead of duck's eggs." That's a case of lumping the advertising results.—D.C.H.

WEIGHT OF MERCURY VS. WEIGHT OF WATER.

Editor, Plumber and Steamfitter. — The other day I had a fellow tell me that mercury and water weighed very nearly the same. Can you tell me the exact figures on both?—L.T.G.

The party that told you the above certainly gave you a bum steer. A cubic foot of water at temperature of 32 deg. Fahrenheit weighs some 62 and a half pounds. 62.418 are the exact figures we believe.

Now a cubic foot of mercury at the same temperature weighs 849.3 pounds.

Your friend was only 787 pounds out of the way.—D.C.H.

Heating and Ventilation of a Large Hotel

Description of the Installations in the McAlpin, New York—The System Installed Is Both Efficient and Common-sense.

The Hotel McAlpin, which has lately been erected at Thirty-fourth Street and Broadway, New York, says Domestic Engineering, is notable for its size, having accommodation for 2,500 guests. It rises twenty-five storeys above Broadway, and extends sixty feet beneath the surface of the street. It cost \$13,500,000.

The accompanying plans will give the reader a general idea of the manner of installing the heating and ventilating equipment in the hotel.

The minimum boiler capacity of the plant is 2,361 horse-power, divided among six sectional water tube boilers.

From the flanged nozzles on each boiler an 8-inch branch is taken out, double-valved with an 8-inch automatic non-return stop valve and straight valves, which supplies high pressure steam through valved branches to the different apparatus requiring it.

The clean drip connections from the high pressure mains are trapped and carried into a main drip, which discharges into the high pressure drip tank. This tank is 4 feet 6 inches in diameter and 9 feet long.

The dirty or oily drips from engine and pump cylinders are carried into a main drip and discharged into the sump ejector system.

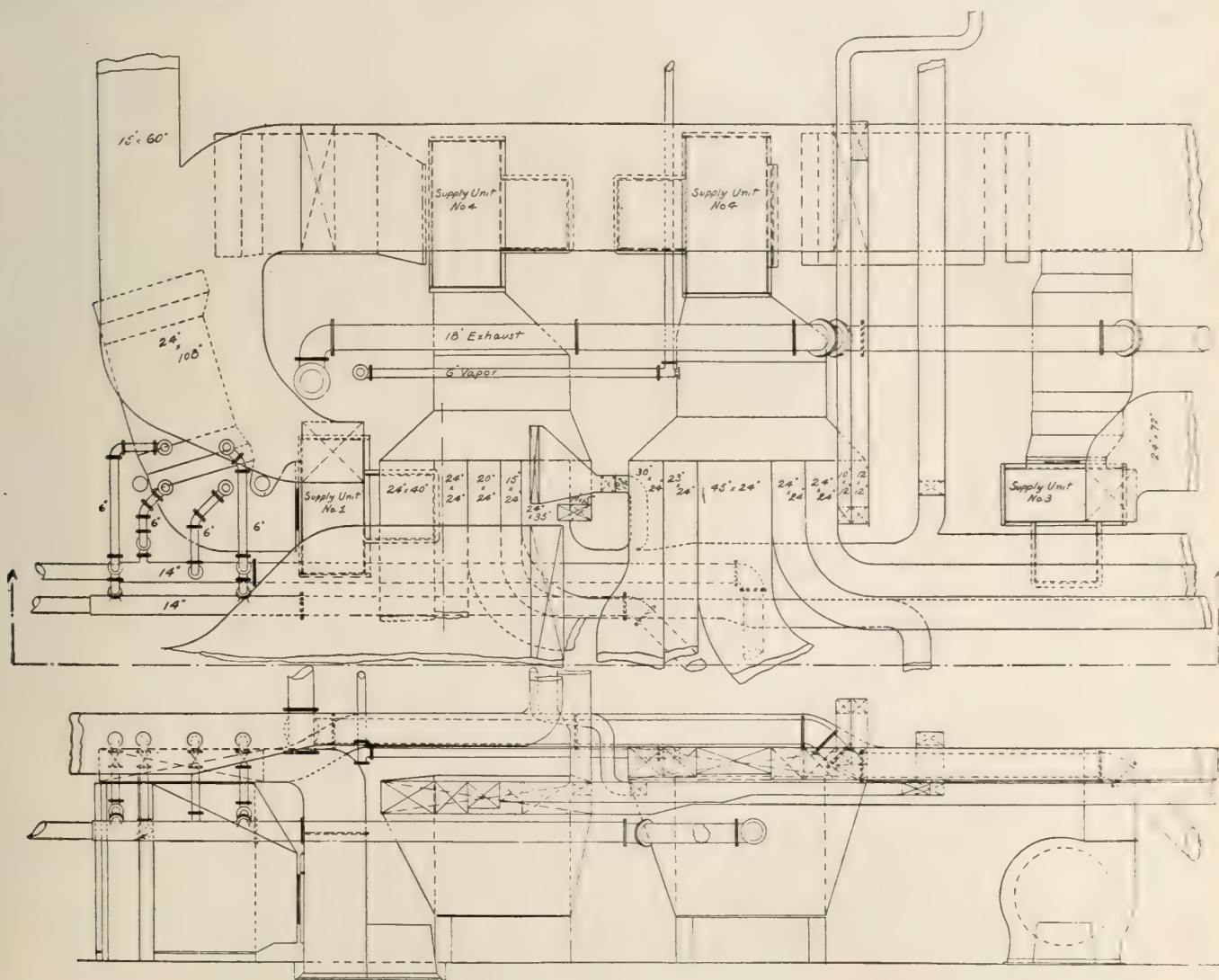
The main exhaust lines are grouped together into an 18-inch main exhaust in the engine-room, and then carried, valved and by-passed, to a 2,000 horse-power feed water heater and a muffler tank.

The heater is built for a working pressure of 200 pounds, and has sufficient capacity to heat 60,000 pounds of water from 50 to 212 degrees F. when furnished with exhaust steam at atmospheric pressure.

From the heater an 18-inch exhaust main pipe is carried up the pipe shaft to a point 20 feet above the roof, being provided with an 18-inch back pressure valve and an 18-inch flanged exhaust head. This vertical exhaust is supported by a pipe stand resting on a concrete foundation. The vent pipes from the sump drip tank, etc., are carried into the 7-inch main vent pipe up the pipe shaft to a point 20 feet above the roof and provided with an exhaust head.

The high pressure steam, exhaust and drip piping is installed with particular care to insure the prevention of the transmission of sound and vibration throughout the building. The power and exhaust piping in the engine, pump and refrigerating rooms are supported on pipe stands.

Steam pipes, 4 inches in diameter and over, subject to boiler pressure, reduced



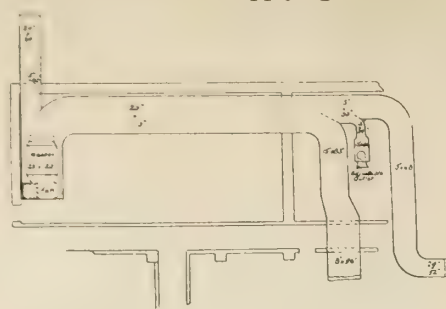
Elevator "AA."—duct work, supply fan room.

high-pressure steam pipes, 5 inches in diameter and over, exhaust pipes and low-pressure steam pipes, 6 inches in diameter and over, are standard full weight steel pipe with flanged ends, with extra heavy weldless rolled steel flanges.

The fittings for piping 4 inches in diameter and over, subjected to boiler pressure, are extra heavy gun iron flange fittings, reinforced, and of extra long sweep pattern. The fittings for other pipe, just mentioned, are extra heavy best cast iron fittings.

Steam pipes smaller than 4 inches in diameter subjected to boiler pressure, reduced high-pressure steam pipes and return pipes for the reduced high-pressure steam systems smaller than 5 inches, high and low pressure drip piping and

This tank is provided with the necessary flanged outlets for supplying the direct



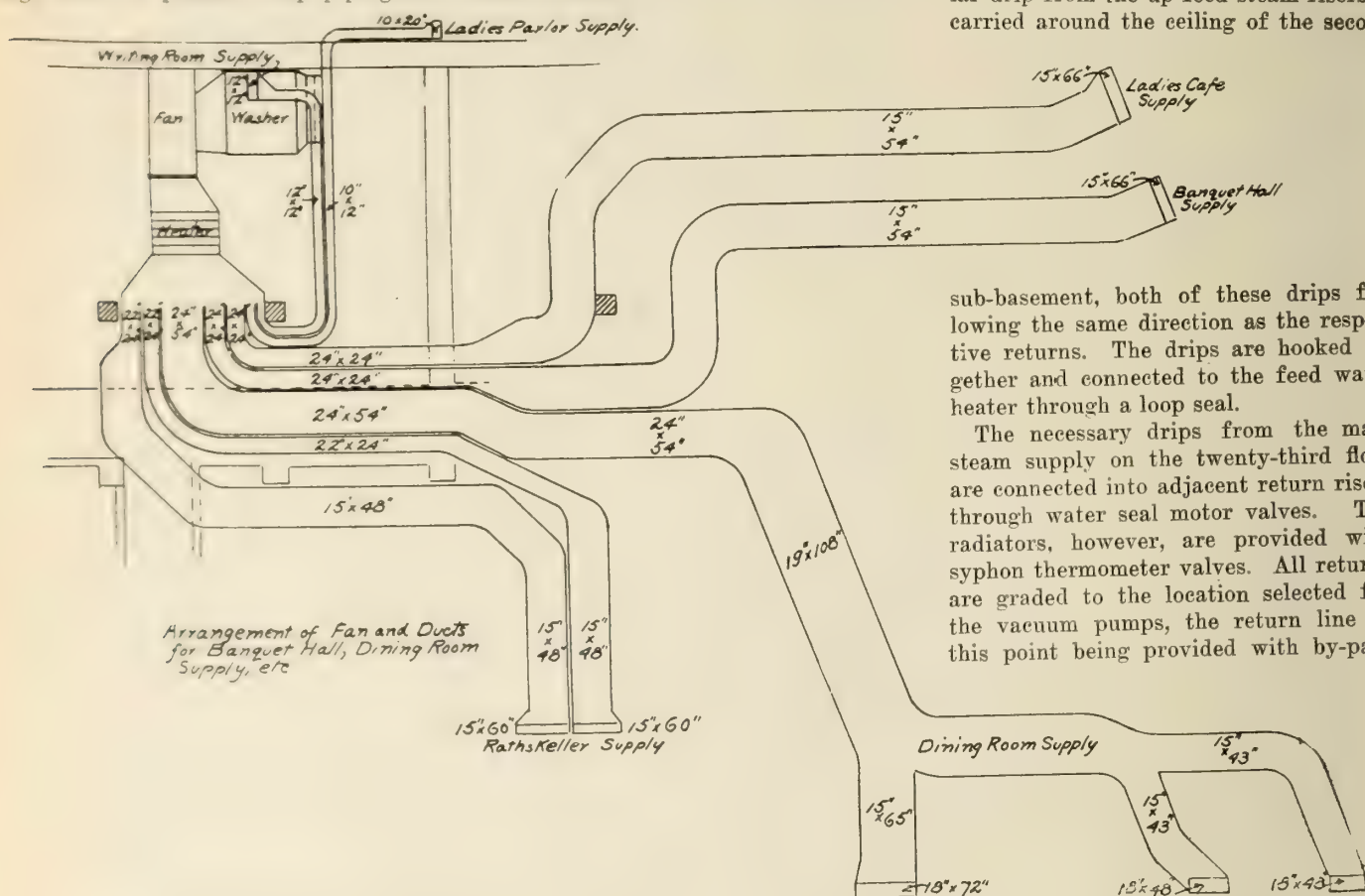
Arrangement fan and ducts for second
sub-basement supply.

radiation, the tempering and heating coils of the indirect system, and the hot water heaters.

The back pressure valve on this 18-inch distributing riser is located on the twenty-fifth floor.

The 10-inch outlet on the muffler tank connects with an independent main for supplying the hot water heaters for the house supply, which are located in the second sub-basement. The returns from the down-feed system are carried around the pipe space between the second mezzanine and the third floor. The returns from the up-feed system are carried round the ceiling of the second sub-basement, the returns from both systems being connected to the vacuum pumps.

An independent gravity drip from the down-feed steam rise is carried around the ceiling of the pipe space, and a similar drip from the up-feed steam risers is carried around the ceiling of the second



Arrangement of fan and ducts for banquet hall, dining room, supply room, etc.

trap discharge pipes are extra strong wrought iron pipe. The fittings for steam pipes are extra heavy cast iron flanged fittings, while the other fittings are heavy cast iron.

For extra heavy flanges, fittings and valves, the flange dimensions and rilling correspond with the schedule of the National Association of Master Steam and Hot Water Fitters for pressure from 125 to 250 pounds.

The building is heated by a system of steam circulation.

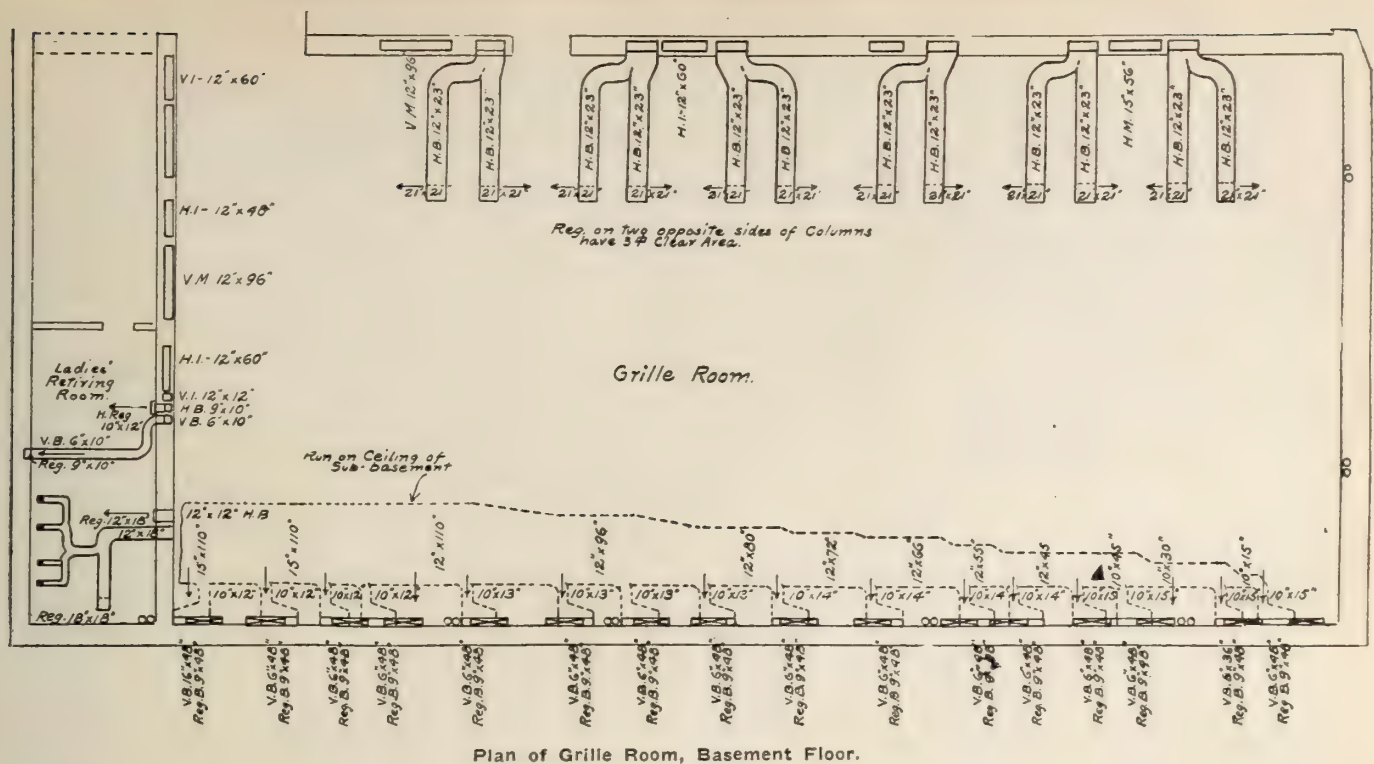
The distribution of steam for various heating purposes takes place at the muffler tank located in the engine-room.

The 18-inch main exhaust piping is used as the heating main for the direct radiation, two branches being taken from the vertical portion of it. An inch branch is taken off at the first sub-basement floor and connected to the mains at this point which supply the direct radiation in the basement, first floor and first and second mezzanines, which radiators are supplied on the up-feed system. A 14-inch branch is taken off on the twenty-third floor, connecting with the mains supplying the direct radiation for the balance of the building; all radiation on the twenty-third floor and below being supplied by the down-feed system.

to the sump for the purpose of blowing out the system. The suction to the vacuum pumps are provided with combination suction strainers and condensers, and are so arranged that either or both pumps will handle the entire amount of condensation.

The discharges from the vacuum pumps are carried to an air separating tank, which is vented to the atmosphere, the condensation which is discharged into this tank being delivered to the feed water heater through a loop seal.

There are approximately 2,000 direct radiators in the hotel containing an aggregate of 56,000 square feet of radiat-



Plan of Grille Room, Basement Floor.

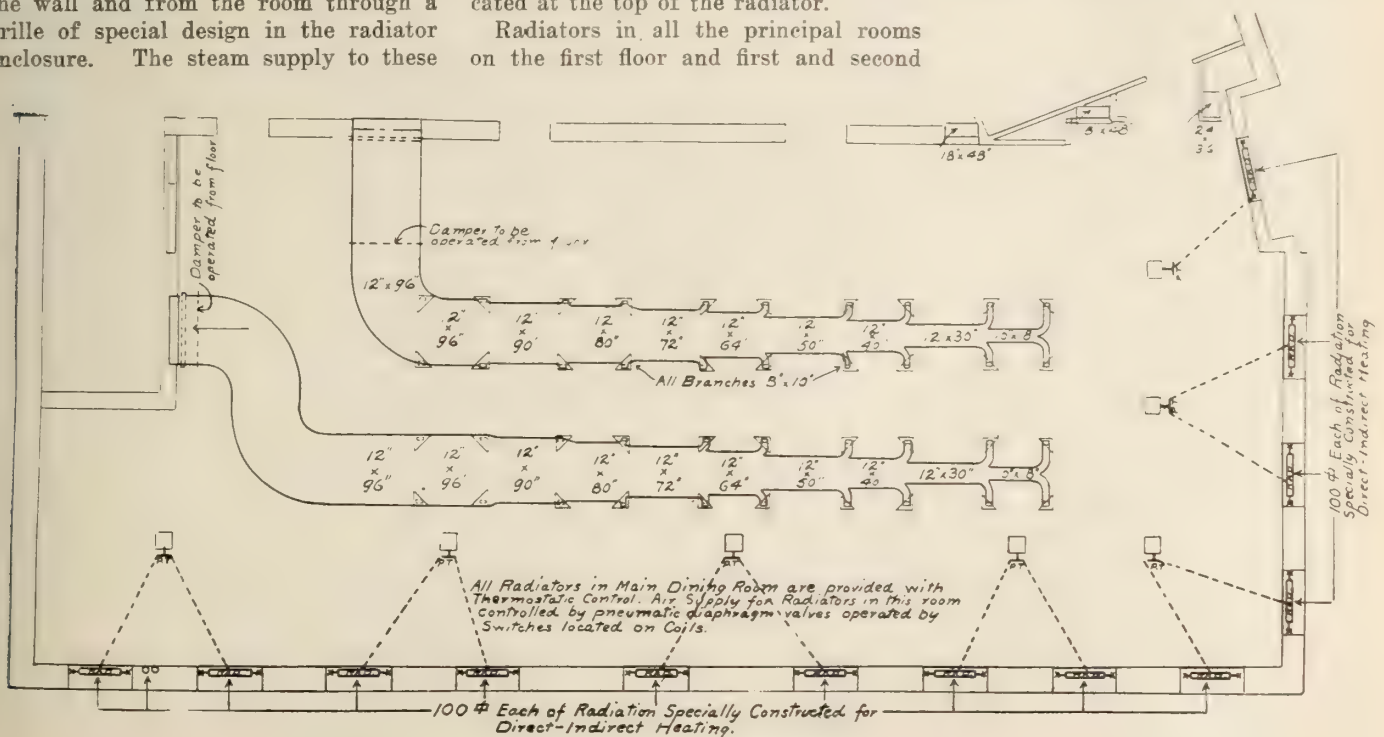
ing surface. All radiators are plain pattern, 1, 2, 3 and 5-column, with a number of wall radiators located in stair halls and in servants' rooms. The tempering and heating coils are composed of radiation of sufficient capacity to raise the air to the required temperature.

The main dining-room is heated by a direct-indirect system of special design and arrangement. There are twelve of these radiators in two tiers of three sections each, located in enclosures under the windows, with intake connections to same extending from the outside through the wall and from the room through a grille of special design in the radiator enclosure. The steam supply to these

direct-indirect radiators is controlled automatically in each case by means of a thermostat and a diaphragm valve; while the dampers are controlled pneumatically by means of push button switches and diaphragm damper attachments and connected to the thermostat and valve system in such a way that the operation of the push button switch by hand so controls the damper arrangements under the radiator that air is admitted to or vice versa. The heated air rises from the radiator in each case and comes into the room through a grille located at the top of the radiator.

Radiators in all the principal rooms on the first floor and first and second

mezzanine, and in all rooms facing the street, on all floors from the third to the twenty-second inclusive, are enclosed in window cases, which are provided with plain lattice grilles, the grilles being finished to match the woodwork. In all cases where radiators are enclosed the enclosures are completely lined with galvanized iron and asbestos paper in the usual manner. All enclosed radiators have the steam supply at the top, and are provided with modulation valves with special extended stems having knuckle joints, the dial and handle of



Heating and ventilating of main dining room.

the valve being attached to the top of the enclosure.

Ventilation.

Iron partitions are built at each end of the ventilating apparatus in the sub-basement, forming air receiving or plenum chambers. Partitions are also built between the fans and coils in the pent house floor to form cones, and at the rear of each heater coil in the pent house floor to form air-receiving chambers.

All of these partitions are made of No. 18 black steel, braced and stiffened with 2-inch angle iron, the side sheets being flanged at the bottom and tightly fitted to the floor.

The hot blast heating and ventilation of the hotel is provided for by a system of units, taking care of distinct portions of the building.

Supply Unit No. 1, second sub-basement, etc.—This unit consists of an 85 x 42½-inch fan, top vertical discharge, having a capacity of 25,647 cubic feet of air per minute at 175 revolutions per minute, direct connected to a 15 horse-power motor. Between the tempering coil and heater is located an air washer capable of handling 25,647 cubic feet of air per minute, and of removing 98 per cent. of the dirt. This unit supplies fresh air to the second sub-basement.

Vent Unit No. 1.—This unit consists of an 85 x 48-inch fan, bottom horizontal discharge, having a capacity of 34,000 cubic feet of air per minute at 200 revolutions per minute, direct connected to a 17½ horse-power motor, and serving the second sub-basement.

Supply Unit No. 2, first sub-basement.
—This unit consists of a 71 x 35½-inch

of handling 19,728 cubic feet of air per minute. This unit supplies fresh air to the entire first sub-basement.

Vent Unit No. 2.—This unit consists of a 71 x 42-inch fan, top horizontal dis-

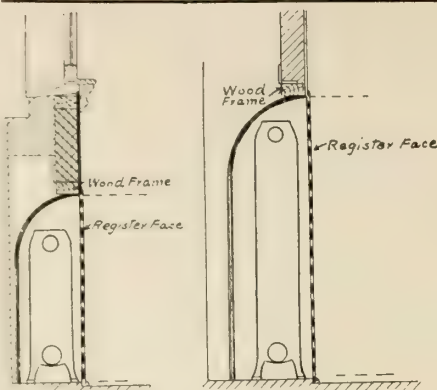


Fig. 1.—Typical section through enclosed radiators where same set under windows on 22nd floor.

Fig. 2.—Typical section through enclosed radiators where same set back in wall on 19th and 22nd floors.

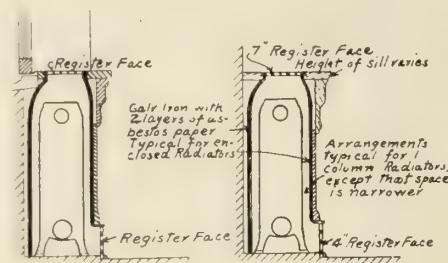


Fig. 1.—Typical section through enclosed radiators where same set under windows on 4th and 18th floors.

Fig. 2.—Typical section through enclosed radiators where same set out in room on all floors.

charge, having a capacity of 24,000 cubic feet of air per minute, or 240 revolutions per minute, direct connected to a 15 horse-power motor, serving the first sub-basement.

Supply Unit No. 3, kitchen, etc.—This unit consists of a 71 x 35½-inch fan, top vertical discharge, having a capacity of 17,000 cubic feet of air per minute, at 200 revolutions per minute, direct connected to a 15 horse-power motor. Between the tempering coil and heater is located an air washer capable of handling 17,000 cubic feet of air per minute. This unit supplies air to the kitchen, barber shop, manicleur parlor, steward's room, toilets, and serving room on second floor.

Vent Unit No. 3.—This consists of an 85 x 42½-inch fan, top horizontal discharge, having a capacity of 24,750 cubic feet of air per minute, at 170 revolutions per minute, direct connected to a 15 horse-power motor. The unit serves the same rooms as supply unit No. 3.

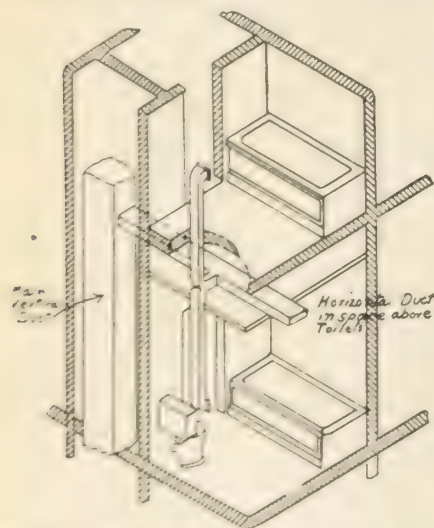
Supply Unit No. 4, main lobby, etc.—This unit consists of a 92 x 46-inch fan, top vertical discharge, having a capacity of 32,325 cubic feet of air per minute, at 180 revolutions per minute, direct connected to a 17½ horse-power motor. Between the tempering coil and heater is located an air washer capable of handling 32,325 cubic feet of air per minute. This fan supplies fresh air to the main lobby, lounging room, men's cafe, etc.

Vent Unit No. 4.—This unit consists of an 85 x 42½-inch fan, top horizontal discharge, having a capacity of 24,550 cubic feet of air per minute, at 170 revolutions per minute, direct connected to a 15 horse-power motor. It serves the same rooms as supply unit No. 4.

Supply Unit No. 5, banquet hall, etc.—This unit consists of a 99 x 49½-inch fan, top vertical discharge, having a capacity of 35,900 cubic feet of air per minute, at 155 revolutions per minute, direct connected to a 20 horse-power motor. Between the tempering coil and heater is located an air washer capable of handling 35,900 cubic feet of air per minute. This fan supplies fresh air to the banquet hall, ladies' cafe, main dining-room, writing-room and rathskeller.

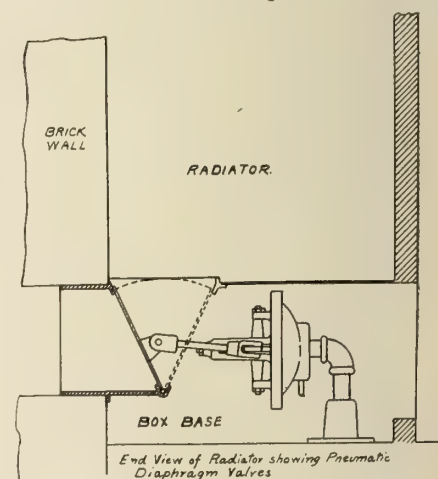
Vent Unit No. 5.—This consists of an 85 x 42½-inch fan, top horizontal discharge, having a capacity of 30,247 cubic feet of air per minute, at 205 revolutions per minute, direct connected to a 17½ horse-power motor. It serves the same rooms as supply unit No. 5.

Vent Unit No. 6, zone "A" toilet.—This unit consists of a 78 x 39-inch fan, top horizontal discharge, having a capacity of 24,000 cubic feet of air per minute, at 220 revolutions per minute, direct connected to a 12 horse-power motor. It



Typical detail of vent connections from sub-basement to horizontal duct.

fan, top horizontal discharge, having a capacity of 19,728 cubic feet of air per minute, at 240 revolutions per minute, direct connected to a 15 horse-power motor. Between the tempering coil and heater is located an air washer capable



serves the interior bathrooms in zone "A" from the third to the twenty-second floors inclusive.

Vent Unit No. 7, zone "B" toilet.—This unit consists of a 78 x 39-inch fan, top horizontal discharge, having a capacity of 24,000 cubic feet of air per minute, at 320 revolutions per minute, direct

connected to a 12 horse-power motor. It serves the interior bathrooms in zone "B" from the third to the twenty-second floors inclusive.

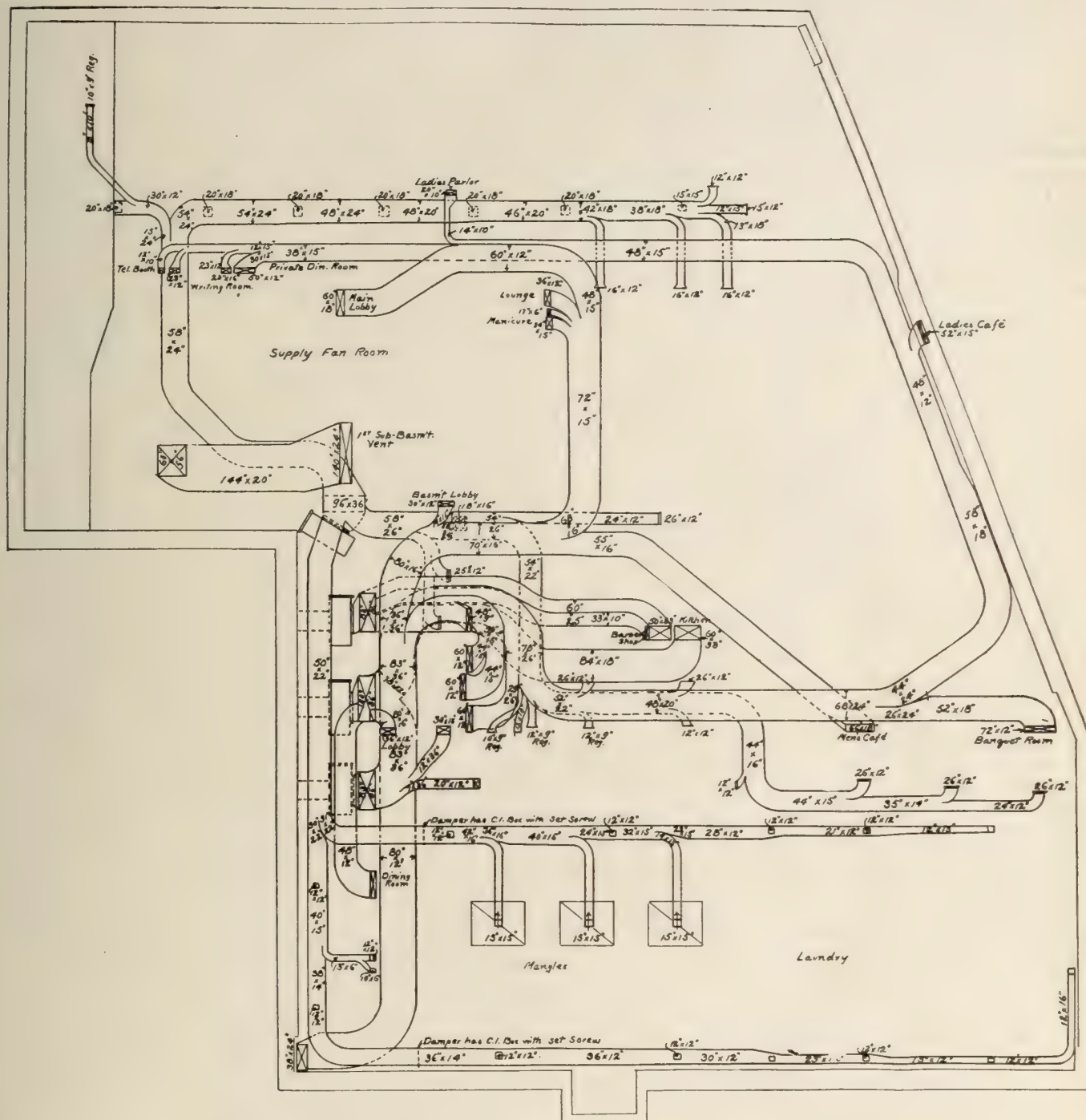
Vent Unit No. 8, zone "C" toilet.—This unit consists of a 71 x 46-inch fan top horizontal discharge, having a capacity of 27,000 cubic feet of air per

Vent Unit No. 9, ballroom.—This unit consists of a 50 x 25-inch fan, top horizontal discharge, having a capacity of 8,000 cubic feet of air per minute, at 280 revolutions per minute, direct connected to a 5 horse-power motor. It serves the ballroom, smoking-room, ladies, retiring room, and ballroom corridor.

5 are located in the second sub-basement.

Supply and vent fans No. 2 are located in the first sub-basement.

Vent fan No. 10 is located in the tank room on the twenty-fifth floor, and is fitted with remote controlling device to control the fan from the Turkish bath.



Second sub-basement showing vent ducts

minute, at 240 revolutions per minute, direct connected to a 15 horse-power motor. It serves the interior bathrooms in zone "C" from the third to the twenty-second floors inclusive, the house telephone rooms on the twenty-third floor, and kitchen and service rooms on twenty-third and twenty-fourth floors.

Vent Unit No. 10, Turkish bath.—This unit consists of a 29 x 14½-inch fan, top horizontal discharge, having a capacity of 3,200 cubic feet of air per minute, at 590 revolutions per minute, direct connected to a 5 horse-power motor. It serves the Turkish bath.

Supply and vent fans Nos. 1, 3, 4 and

The other fans are located on the twenty-third floor.

The fans and blowers are full house steel plate of the centrifugal type, and are of extra heavy construction throughout.

(Continued on page 23.)

Complete Course in Sheet Metal Work

By L. W. KOSER

Draw in the profile shown by the heavy line which is the profile of the bottom of the Hip Bar for mitring into the corner of the curb.

Now at X, Fig. 10, and at right angles to the lines drawn from T, draw a common bar the same size and shape as shown at Fig. 8 and 9.

Number each of the points on same. Project lines up from each point until they meet lines having the same number.

This gives us the points for drawing the profile Y, which is the correct profile of the Hip Bar.

At right angles to the line W.-V draw the line D-E. and on this lay out a

stretchout of the correct Hip Bar Y.

Project the usual measurement lines from each number.

Bring the angle at T square parallel to D-E and bringing it against each of the points on the profile W-T and V-M. Cut lines of the stretchout having the corresponding numbers.

Connect these lines and the pattern is developed.

Next we take up the development of the top mitre for the Jack Bar (the bottom mitre is the same as the mitre on common bars).

Fig. 12 is a plain view showing the

Jack Bar mitring into the Hip Bar at "a."

A corner section is the first drawn as follows:

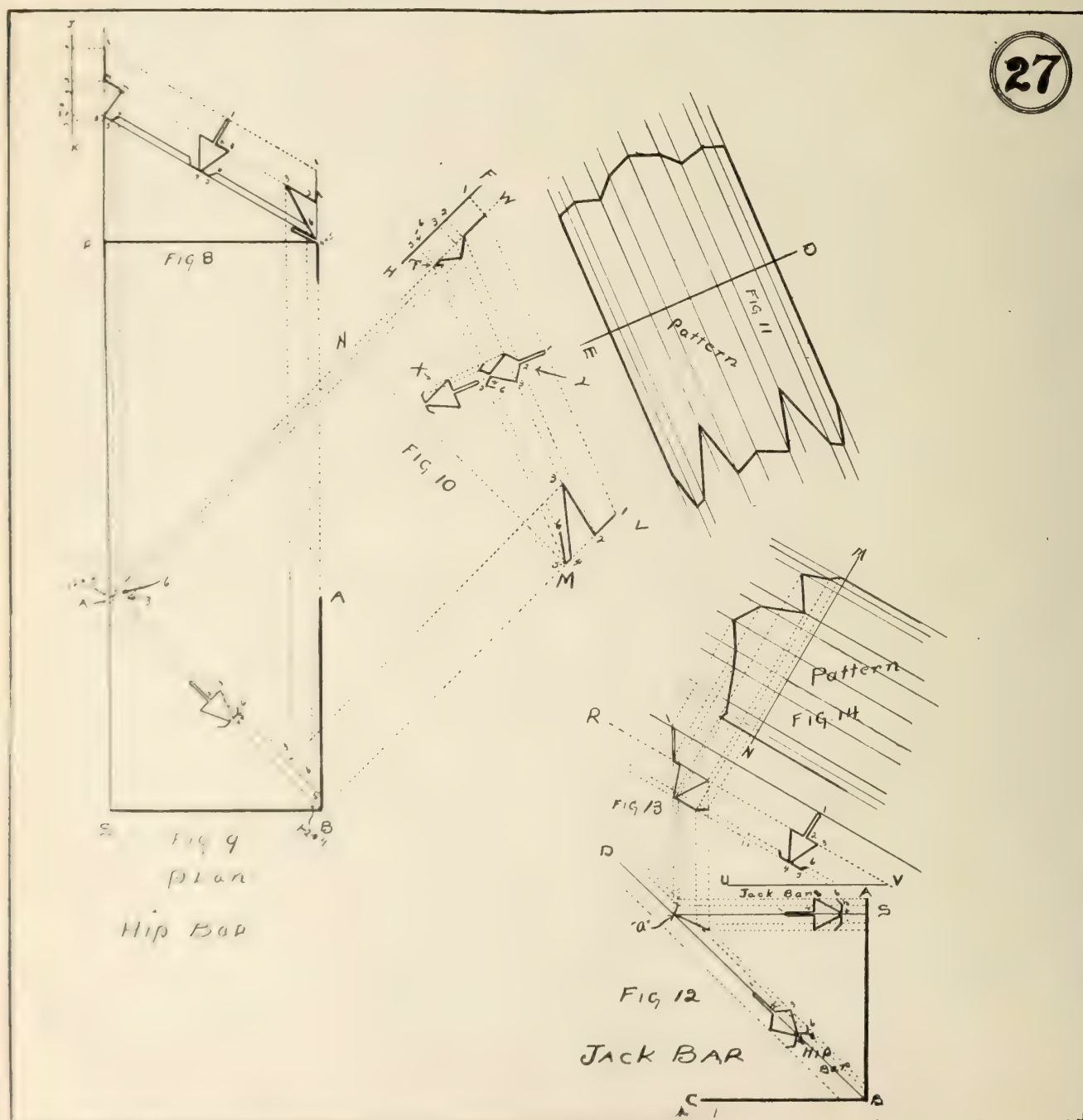
Draw the Right Angle Lines A-B-C.

Then the centre of the Hip Line B-D.

Erect on this line a detail of the Hip Bar and project lines from each point parallel to the line B-D.

Now at any point on the line A-B as at "S" draw a perpendicular or right angle line until it intersects the centre line of the Hip or the line B-D. This is the centre line of the Jack Bar.

Now erect on this a profile of the Common Bar.



Draw lines from each point parallel to the centre line until they intersect lines having the same number drawn from the Hip profile.

Now off to one side of the Jack Bar and parallel to the line "a" draw a line as U-V and erect the line V-R 1-3 or 30 degrees pitch the same as Fig. 8.

On this line draw a common bar as shown and project lines from each point.

What we want to do now is to develop the profile of the Jack Bar Mitre.

This is shown at Fig. 13.

You will notice that there are two profiles which is owing to the fact that the shape of each side of the top of the Jack Bar is different, the side nearest the Hip being shorter than the other side so as to fit on the bevel.

To develop these profiles we proceed as follows:

Draw line from the point 1 "a," Fig. 12, and at right angles to the centre line of the Jack Bar.

Project this line until it meets the line 1 of Fig. 13. No. 2 is also in line with No. 1.

Complete the profile of the "off" side first by next drawing lines from points 3-4 and 5 until they meet lines 3-4 and 5 of Fig. 13.

Connect these lines and the one profile is developed.

Now repeat this for the inside profile by drawing lines from the inside points until they meet lines having the corresponding numbers on Fig. 13. Connect these points and the deep throated profile is developed.

Now at right angles to the line R-V of Fig. 13 draw the stretchout line N-M, Fig. 14, and lay off on this the stretchout of the Common Bars or Jack Bars drawing the usual measurement lines through each point. Then with the T square on angle parallel to the stretchout line carry lines from each of the points on the two profiles to the lines having the corresponding numbers. Draw the narrow profile into one half of the stretchout and the deep profile into the other half.

This completes the mitres for the three styles of Skylights.

We will next take up Ventilators for Skylights.



HEATING AND VENTILATION OF A LARGE HOTEL.

(Continued from page 21.)

Carrier air washers are used throughout.

The foundation for the heater coils, tempering coils, steel plate supply fans, air washers, pumps and motors are constructed of concrete.

An I beam platform of sub-base is provided for all of the ventilating fans and motors above the sub-basement floor. These platforms are made of heavy steel "I" beams, with connecting angles, etc. The foundations and platforms are insulated with 2½-inch sheet cork laid in and covered with pitch.

Adjustable deflectors or air regulating dampers are attached to each branch supply duct leading from the fan chambers for regulating the volume of air supplied to the branches or openings. The deflectors and air regulating dampers are made in such a way that they may be used for regulating or controlling the air passing through each duct, and also for closing the duct when no heat or air is required in the room it supplies.

The air-regulating dampers are of the pivoted type, and are made of heavy galvanized iron provided with an operating and fastening device, so that they may be set and fastened in the proper position.

Deflecting plates are provided in all registers or grille boxes for the purpose of deflecting the air.

Vertical risers over 26 inches in width have 1½ x 3-16-inch bar braces placed on edge in centre of duct and 7 feet on centres. Horizontal ducts are suspended from the floor or roof with heavy iron hangers. Vertical risers are secured to the walls or columns on 8-foot centres.

Covering.

All high pressure steam, exhaust, drip, vapor, lead, blow-off, valves, fittings, etc. in sub-basement are covered with sponge felt. The vertical exhaust in the the pipe shaft is also covered with sponge felt and re-canvassed with 8-ounce canvas sewed on. All direct heating mains, branches and returns in sub-basement, basement, second floor pipe space, 23rd floor pipe space and pent house are covered with asbestocel. Direct heating risers, returns and branches passing through special design rooms, corridors, etc., are also covered with asbestocel.

Hot air ducts passing through cold or tempered air chamber, or rooms, are covered with asbestos paper with lapped joints, which in turn is covered with hair felt securely fastened, and then covered with 8-ounce canvas with lapped joints and sewed on.

The hotel was designed by F. M. Andrews & Co., architects, New York. The Thompson-Starrett Co. were the heating contractors.



DEATH OF CHAS. H. PARSONS.

Chas. H. Parsons, first vice-president of the American Hardware Corporation, died of pneumonia at his home in New

Britain, Conn., Sunday, April 13, aged 66 years. The late Mr. Parsons had been associated with the hardware trade for many years, having at the age of twenty entered the employ of Landers and Smith, now Landers, Frary, and Clark. He was associated with Landers and Smith for seven years, and left them in 1873 to enter the employ of P. & F. Corbin as salesman travelling in New England and Canada. Mr. Parsons duties on the road required only a portion of his time, and the balance he devoted to the order department. His home duties gradually assumed greater importance than those on the road, and when the general conduct of the sales department was transferred from New York to New Britain in 1879, Mr. Parsons became the first sales manager of the company. Since that time and until entering his larger field in the American Hardware Corporation, Mr. Parsons had charge of the marketing of P. & F. Corbins products. In 1883 he was elected secretary of P. & F. Corbin. In 1891 he was made a director and since that time he has successively been elected to the office of 2nd vice-president, 1st vice-president, and president of P. & F. Corbin. In 1912 when the American Hardware Corporation was formed, Mr. Parsons was made a director and assistant treasurer, in addition to his duties as executive officer of P. & F. Corbin. He was later made 2nd vice-president, and at the death of Philip Corbin was elected 1st vice-president of the American Hardware Corporation, which office he held at the time of his death. He is survived by his wife, his sister and four sons. His eldest son, Chas. B. Parsons, succeeded his father at the head of the P. & F. Corbin business when Mr. Parsons was made 1st vice-president of the American Hardware Corporation. Howard S. Parsons is also identified with the P. & F. Corbin division, as salesman, in New England. Stanley M. Parsons is connected with the Stanley Rule and Level Co. having just been made manager of their New York Store. His fourth son, Munroe, is a student at Hotchkiss University.



PROPER AMOUNT OF HEAT FOR THE JOINT.

Editor, Plumber and Steamfitter. — I am learning to wipe lead joints and find it hard to judge when the right heat has been arrived at to begin wiping and I thought that you might be able to tell me. Can you?—Helper.

At the time that the joint has got so much heat that the solder slides off, in spite of all attempts to keep it in position, then the proper moment has come to drop the ladle, shift the wiping cloth to the hand that wipes the joint and proceed.—D.C.H.

Why the Trade Secured a Bad Name

Why is the plumber always publicly abused?

The question at the head of this article was asked by "Plumber" in the March 1 number of the Plumber and Steamfitter. D. C. H. gave one reason, but there are many others. The old law, "give a dog a bad name and it will stick" may answer here by changing the word dog.

In past years ninety per cent. of the plumbers' work was hidden under floors, in boxes, walls, in attics, etc. As an illustration, a plumber and helper worked on a job for a couple of weeks. All the pipes were installed and tested. Floors were laid and everything made ready to have closet, bath and all other fixtures set and connected. The owner of the house came in to have a look at the work and all he could see as a result of the plumber's two weeks work was several pipe ends protruding through the floors. At once he started calling down the plumber for being a lazy, loafing thief. He failed to take into consideration the fact that the pipes, entailing the making of many wiped joints, were all covered from sight and the more you tried to convince him that he had received honest labor for his cash the more he would talk about the scheming plumber whose principal occupation, according to his ideas, was to invent methods of idling away time. This kind of complaining has helped a lot to give the plumber as a worker a bad name. However, this trouble is not so formidable to-day, as much of the pipe work in modern plumbing is exposed. But the reputation received in the past sticks.

Personally I have spent many years as a journeyman plumber and master plumber and I am forced to say that I consider many plumbers are partly to blame for the name we get. A customer gives an order for a plumber to be sent to his residence to make some repairs or alterations. The plumber starts for the job, taking a helper along with him. When he arrives at the residence he discovers that he will require certain material to complete the work, but instead of sending his helper back at once for the required material, he starts in and does the work up to the point where the material mentioned is necessary. He will now dispatch the helper for the things needed and in the interval he will stroll around, fill his pipe, and enjoy a smoke. It may be only for a short half hour or less but the lady of the house seeing him idle is apt to exaggerate

greatly when describing the action of the terrible plumber to her husband in the evening. This very careless trick of the plumbers while on repair work, helps the plumber's reputation as loafers-on considerably.

Another point which should be touched upon is this: In no other business is there required a more thorough technical, as well as practical knowledge of the trade, than in plumbing. If the plumbers of to-day wish to take the position they should occupy they must apply themselves to making a thorough study of their business. I am not referring to the master plumbers only, but to the journeymen and improvers as well. Question a number of plumbers about hydraulics and air problems, one or both of which is in force in every pipe they install; give them a few simple problems where it will be necessary to use some simple formulas and a little reasoning and it will be an eye opener to the investigator to learn how many of them will stick. I have made the experiment and know that this is the case.

Ask the ordinary journeyman plumber at what pressure an ordinary range boiler will burst, giving him the necessary dimensions, etc. He will probably say, "Well, it is tested at 250 pounds to the square inch, so I guess it will stand considerably more than that. This would be no answer to give an intelligent questioner. Any plumber should be able to figure out the bursting pressure of a range boiler, theoretically, and dozens of other questions he should be able to master in the same way.

Well I might go on until I had filled several pages of the Plumber and Steamfitter, but I think I have written enough to show that all these little and big points which many of the plumbers fail to attend to properly, tend to place them on a plane lower than lots of other mechanics. There are many to whom these remarks cannot apply. Men who know their business from A to Z, but they are not numerous enough to counteract the bad effects caused by those who appear to think that so long as they can install a job in a passable manner that they know all that is to be known. There is no excuse for these idlers, for never in the world's history was it so easy to secure a good knowledge as at the present. The trade journals, correspondence, and free technical schools are numerous. The charges of the two first named are generally very low considering the value they give, so that anyone with am-

bition can secure a first class technical education if he so desires.

J. E. N.

APPOINTED CHIEF OF FIRE DEPARTMENT.

St. John, N.B.—Honors have been heaped upon one of St. John's foremost master plumbers, George Blake, who has been appointed chief of the fire department of St. John, succeeding the late John Kerr, K.C. The appointment is a very popular one, and has met with the approval of the great majority of the citizens. Mr. Blake has been connected with the local fire department for a great number of years, and has had much practical experience in fighting some of the greatest of local fires. He was senior officer in the department at the time of Chief Kerr's death, and has accepted the position of chief engineer only temporarily, as he does not wish to have to abandon his plumbing business in Germain Street. His term of office will continue until next September, and should he desire to continue in office the position would probably be kept open to him, as there is general regret that he cannot see his way clear to accept the offer permanently. At any rate, he will hold office until a re-organization of the department has been effected. Mr. Blake is president of the St. John Master Plumbers' Association, and is respected by all who know him.

TRADE NOTES.

Kingston, Ont.—Beginning May 1 plumbers in this city will have their pay increased to \$3 per day of eight hours.

Toronto, Ont.—After having presided over the Plumbers' Union for seven years, David Bullock was made the recipient of a handsome gold locket as a token of the esteem in which he was held by the members of the union.

Saskatoon, Sask.—The Modern Plumbing and Heating Co., also commonly known as Leduc Bros. & Co., are making preparations for constructing a new two-storey building, 24 ft. x 60 ft., in which they will install a modern plant for carrying on all kinds of tinsmithing, plumbing and roofing work.

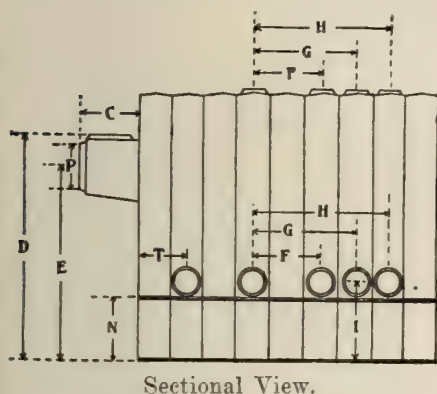
Toronto, Ont.—Twice within the past month has fire broken out in the plant of The Standard Sanitary Co. Latest damage is estimated at \$1,500, all of which is covered by insurance. Although some stock was damaged, the filling of orders will be carried on without any serious delay.

Jolts for Journeymen--By "Phoenix"

INFORMATION OFTEN OVER-LOOKED.

In just about three jobs out of ten there is generally something that goes wrong with the boiler, steam or otherwise. An instance to the point:

A certain master had a boiler shipped to a point 250 miles from his shop. When it got there he sent a fitter to put in the steam job and when he was ready to set up that boiler he found it some five inches too high for the low cellar in which it was to be placed. Ever do that trick Mr. Fitter? Now such a mistake was entirely uncalled for and was a big blunder on the part of the man that ordered the goods. If he had looked up the boiler in certain parts of the boiler catalogue he would have found its measurements given in so plain a manner that he could not pos-



Sectional View.

sibly have gone wrong, if he had any "horse sense" at all. For instance, if he had turned to certain pages and found a cut like that we reprint as the "front view," and had traced out the height as shown by the line marked "B," he would have then known in advance the exact number of inches the boiler was in height. So, in the case of our friend just mentioned, much time and annoyance would have been avoided and quite a good-sized freight bill saved. When any one makes a "bull" like that, it gives the shop a black eye which it doesn't get over right away. From the extreme height of the section, as shown by "Y" in the front view, there should be at least two feet of head room. Of course I am aware that steam jobs have been put in where the head room was a good deal less than this,—in fact I have put in dozens of jobs in low cellars where I did not have two feet in the clear from the top of the

boiler. Just the same one can make a far more mechanical looking job, do it far easier and stand the chance of having an easier working plant if there is sufficient head room. So it pays to look this item up in the catalogue before getting the boiler on the job dead blind.

There is another point upon which fitters and contractors seem just "possessed" to make blunders, and that is as to the size of the smoke pipe and also the distance that the boiler should be set from the cellar wall,—I refer to the back end of the boiler as represented by the letter "C" in the "sectional view." Now here are two very simple points upon which there should never be the slightest doubt in the world; yet time after time will the boilers be set so close to the wall that there is the very deuce to pay to get the smoke pipe installed. Fitters will, many times, take a chance on "guessing" at the size of the smoke pipe. I knew of one up in the North-west that had some 20 feet of heavy galvanized iron pipe come wrong. He order 12 inch and it should have been 15 inch. One would hardly credit a fitter with being so foolish as to take a chance on a matter of this kind, but it is so and I presume that it happens several times each season in various parts of the land. Just pure shiftlessness I call it. One has the boiler and if that is not available the catalogue sure is, for measurements of all kinds and descriptions. It seems to me that there is a big chance for both the contractor and the steamfitter to get mighty busy and acquire the catalogue habit to the extent of knowing more about the line of goods that they are handing out to the people.

This applies to all plumbing and heating goods, not merely to boilers. The average master plumber will have a pile of catalogues in his place of business six feet high and not know one blamed thing about what there is in those catalogues. Encouraging, isn't it for the manufacturer who spends thousands of dollars and months of time in getting up a catalogue for the trade's benefit.

Some of these catalogues have been years in preparation and are almost a practical education in themselves. I would recommend any plumber that thinks he is well up in the game, to pull down the pile of catalogues he has received for the past year and go through them rather carefully and if he does not

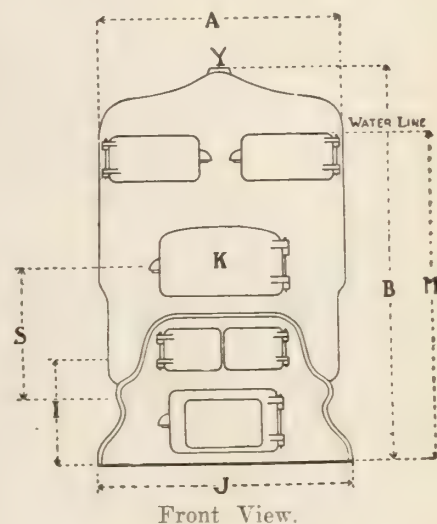
get next to several interesting facts that he was not on to before you can call me a misinformer.



AMOUNT OF PRESSURE SHOWN BY MERCURY GAUGE.

Editor, Plumber and Steamfitter. — Will you please tell me how many pounds of pressure there is on a gas job when the mercury in the glass gauge registers some twenty inches?—B.N.

In the case you mention there would be ten pounds pressure. From this you can figure out the amount of pressure that any height the mercury shows in inches. —D.C.H.



Front View.

CATALOGUES AND BOOKLETS.

The Stark Rolling Mill Co., Canton, O., manufacturers of "Toncan Metal," have recently sent out to the trade a new text book on corrosion and its cause. The booklet is made up of three sections. Section one gives much valuable technical information on ferrous metal in sheet form dealing with rust and corrosion, how they may be eliminated, and the factor value of a coating for metals. Section two is illustrative of the many qualities and properties of "Toncan metal and shows a few of the most prominent installations on which this metal has been used. The last section comprises a catalog giving full descriptions with cuts, weights per square and gauges, of the various forms of Toncan metal as used for flat sheets, roofing, siding, eaves, etc., etc., together with rules of measurement in selling sheet metal building material.

Plumbing and Heating Markets

MONTREAL.

Montreal, April 29.—Plumbers are very busy and there is lots of work in sight for the entire season. The building operations have commenced and the fine weather of the past few weeks has given a new impetus to these operations. Estimates are being given on some big jobs.

Prices remain about the same as last report but with an advancing metal market prices are very firm and liable to advance on short notice. It is predicted that the price on 30-gallon boilers will be shortly increased and an advance in pipe is anticipated. Deliveries are coming forward slowly and there is a likelihood of another tie-up again this season. Manufacturers state that they are better prepared to handle the business offered this year than ever before, but even with this preparation it is hardly likely that there will be a shortage as the demand is going to be very heavy.

Preparations are going forward smoothly for the coming convention of plumbers and steamfitters and it is expected that the convention will be a big success.

Iron Pipe Fittings.—Canadian malleable, 40 per cent.; cast iron, 65; standard bushings, 70; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 75; malleable lipped unions, 65.

Soil Pipe and Fittings.—Medium and extra heavy pipe up to 6 inch, 60 per cent.; 7 and 8 in. pipe, 45 per cent.; medium and extra heavy fittings, 70 per cent.; light pipe, 60; fittings, 60 and 5 per cent.

Range Boilers. — 30-gallon, standard, \$5.00; extra heavy, \$6.50.

Kitchen Sinks. — Cast iron, 16 x 24, \$1.18; 18 x 30, \$1.15; 18 x 36, \$1.95; flat rim enameled sinks, 16 x 24, \$2.45; 18 x 30, \$3.00; 18 x 36, \$3.90.

Heating Apparatus. — Hot water boilers, 45 and 15 per cent.; hot water radiators, 42 and 15 per cent.; steam radiators, 44 and 15 per cent.; wall radiators, 37 and 15 per cent.; specials, 25 per cent.

Lead Pipe.—Lead pipe, 7½¢, 15 per cent. off; lead waste pipe, 9¢, 15 per cent. off; traps and bends, 40 per cent. Solder, per lb. — Bar, half-and-half, guaranteed Montreal, 30½¢. Wiping Montreal, 28½¢.

Sheet Zinc.—5-cwt. casks — Montreal, \$8.25. Part casks—Montreal, \$8.50.

Spelter.—Foreign, per 100 lb.—Montreal, \$7.

Tin and Tinplates.—Lamb and Flag and Straits—56 and 28-lb. ingots, 100 lb. Montreal, \$54.

The new net price list on black and galvanized iron pipe is given in the table below, which applies to both Quebec and Ontario:

Size.	List Price.	Black 63% off.	Galv'd. 48% off.
¼ in., ½ in.	6.00	2.22	3.12
¾ in.	8.50	2.64	3.48
1 in.	11.50	3.16	4.31
1 ¼ in.	17.00	4.67	6.37
1 ½ in.	23.00	6.32	8.62
2 in.	27.50	7.56	10.31
2 ½ in.	37.00	10.17	13.87
3 in.	58.50	16.08	21.93
3 ½ in.	76.50	21.03	28.68
4 in.	92.00	25.30	34.50
4 ½ in.	109.00	29.27	40.37

TORONTO.

Toronto, April 30.—Several changes have been made in prices of plumbing goods since last writing. Lead pipe, traps and bends, have all taken big advance. A new schedule on iron pipe showing an advance on all but ½ inch sizes has been mailed out to the trade and is already in force. Further revision has been made in enamelware prices, changes made being chiefly on lavatories, but none of very great import. Range boilers hold quite firm with tendency to advance, owing to increase of raw material. Metal markets hold firm with advancing tendency. Slight advances have been noted in spelter, pig and caulking lead and copper and all hold firm at high prices.

Money situation has cleared up greatly during past two weeks. Building operations have been going on more freely, so that prospects for future are brighter. In the West, collections are still said to be in bad shape, but signs of improvement are being given. In spite of reported tightness of money, one local firm states that they have already shown a marked increase over last year's business, which predicts fairly for the coming season.

Enamelware.—A further revision of prices has been made since last writing. According to new lists, lavatories have advanced slightly, but practically no changes are to be noted in other lines. Market holds firm, under good demand, and changes, if any, are likely to be upward.

Higher Prices on Iron Pipe.

Iron Pipe and Fittings.—Revision has been made in iron pipe schedule and shows an advance of anywhere up to 7½ per cent. on all but ½ inch sizes, which hold unchanged. This is due largely to increase of cost of raw material, and heavy spring demand.

The new schedule is given in full as follows:—

Size.	Price per 100 ft.
Black.	Galvanized
¼ in., ½ in.	2.28 3.18
¾ in.	2.72 3.57
1 in.	3.28 4.23

1 in.	4.85	6.55
1 ¼ in.	6.56	8.86
1 ½ in.	7.84	10.59
2 in.	10.55	14.25
2 ½ in.	16.67	22.52
3 in.	21.80	29.45
3 ½ in.	26.22	35.42
4 in.	31.07	41.97

Fittings hold same as quoted last issue, as follows: Cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bushings, 65 per cent. off; malleable iron bushings, 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—Prices on soil pipe hold firm, but unchanged. Manufacturers continue to work factories to uttermost to supply demand of jobbing trade. Inquiry from the trade is steadily on the increase with renewed building operations. Judging from the way in which jobbers are stocking up, an advance might almost be suspected. Prices are: Medium and heavy, 60 and 5 per cent.; 7 and 7 inch sizes, 45 per cent.

Advance in Lead Pipe, Traps and Bends.

Lead Pipe.—Last week an advance was made in all lead pipe, lead traps and bends. Discounts on lead pipe are now 15 per cent. instead of 20 per cent., and on traps and bends 40 per cent., instead of 50 per cent., as formerly.

Solder.—Latest quotations on solder in Toronto give easy wiping 26, half and half at 28¾ to 31 cents. Owing to high prices of tin and lead there appears to be an advancing tendency to solder markets. Prices at present hold quite firm.

Boilers and Radiators.—Boilers continue in good supply, discounts still remaining at 45 per cent. From the manufacturers' standpoint radiators are still scarce and in good demand. Standard continue at 44 per cent. off, and wall at 40 per cent. off list prices.

Metals.—During past two weeks spelter has advanced 10 cents per 100 lbs. Copper remains about same, prices ranging from 16.10 to 16.35, which is an advance of only a few cents over two weeks ago. Pig lead and caulking lead have each gone up about 1 cent per lb. Tin holds firm at advance of 1 cent per lb. reported last issue. Iron and steel show no change in price, but deliveries are very tardy on all bars, hooks, sheets and plates. Babbitt metals range in price from 6 to 60 cents per lb., according to brand. Pig iron situation is practically unchanged. General tendency of metal market appears in upward direction.

Winnipeg, Man.—The Clyde Plumbing and Electric Company, Ltd., have been granted a charter, with capital of \$20,000. The directors are Mark Hoffman, Mrs. M. Hoffman, J. Mitchnik, J. S. Cameron and L. A. White, all of Winnipeg.

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Made in different designs.



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TORONTO

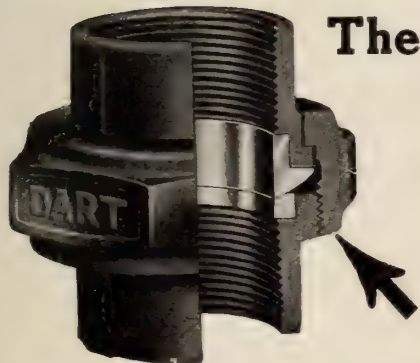
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"Dart" Unions are made in all con-
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FOR SALE—SECOND-HAND SET OF TINSMITH'S machines and tools. Cheap; only used a short time. Apply to The Wm. Beatty Co., Ltd., Farry Sound, Ont. (9)

FOR SALE—BUSINESS OR HALF INTEREST in plumbing and heating company in growing western Ontario city. Splendid opportunity for a live man. Details on application. Apply Box 772, Plumber & Steamfitter, Toronto, Ontario. (8)

FOR SALE—ONE TAYLOR-FORBES CAST iron sectional boiler for low pressure heating; used only a short time. Too small for building. Manufacturers' rating 5,000 square feet. For particulars apply to New Brunswick Telephone Company, Limited, St. John, N.B. (11)

FOR SALE—PLUMBING AND HEATING business in one of the best towns in western Ontario. Good reasons for selling. Apply to Box 788 Plumber & Steamfitter, Toronto, Ont. (11)

PARTNER WANTED

PRACTICAL TINSMITH WITH \$2,000.00 who can lay out work as partner in an old established plumbing, heating and tinsmithing business in good Ontario town. Sickness causing retirement of present partner. Apply Box 780, Plumber & Steamfitter, Toronto. (16)

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PLUMBER AND STEAMFITTER WANTED—state wages and references. Box 755, Plumber and Steamfitter, Toronto. (8)

WANTED—MAN WITH PRACTICAL EXPERIENCE in plumbing and steamfitting trades. Must have good education and address. Splendid opportunity for man who can qualify. Box 786, Plumber & Steamfitter, Toronto.

MISCELLANEOUS.

ADDING TYPEWRITERS WRITE, ADD OR subtract in one operation. Elliott Fisher, Limited, Room 314 Stair Building, Toronto.

COPELAND - CHATTERSON SYSTEMS—Short, simple. Adapted to all classes of business. The Copeland-Chatterson Company, Limited, Toronto and Ottawa. (1f)

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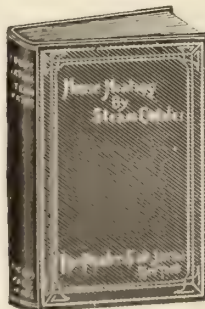
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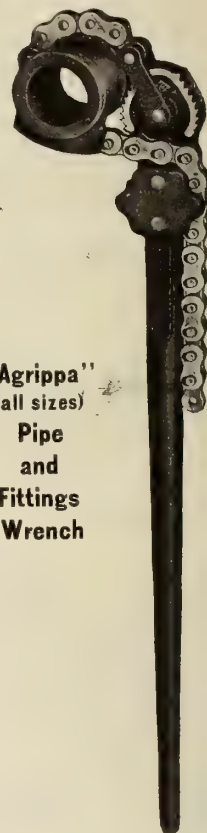
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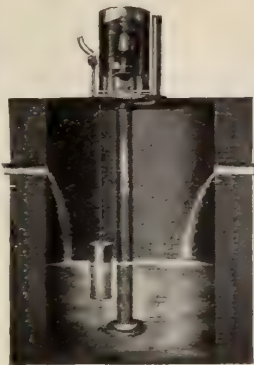
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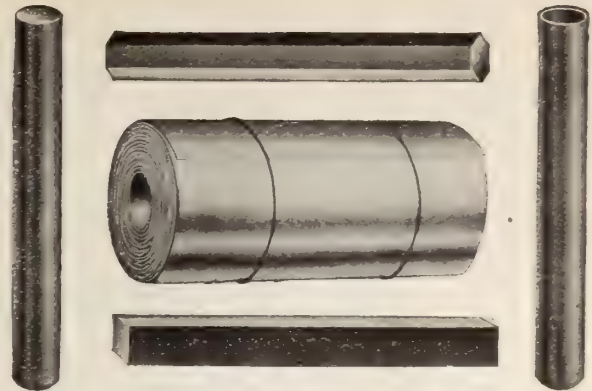
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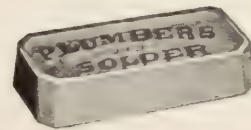
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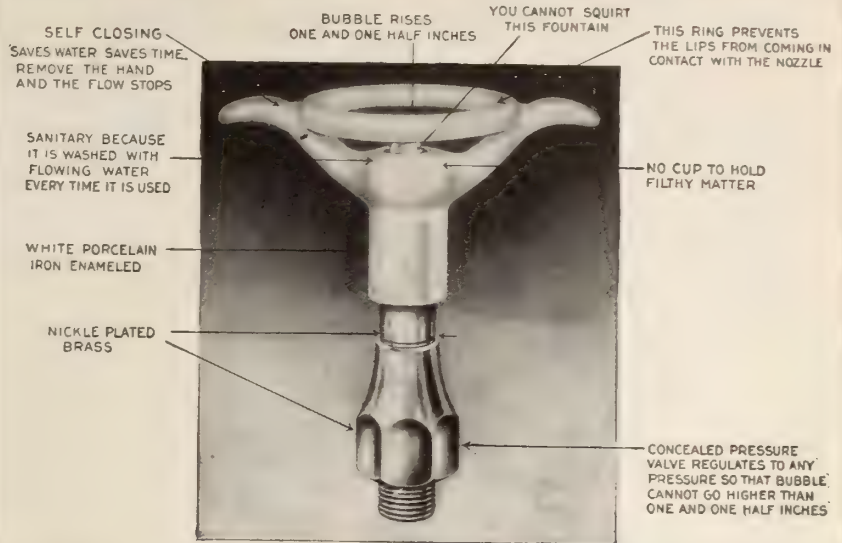
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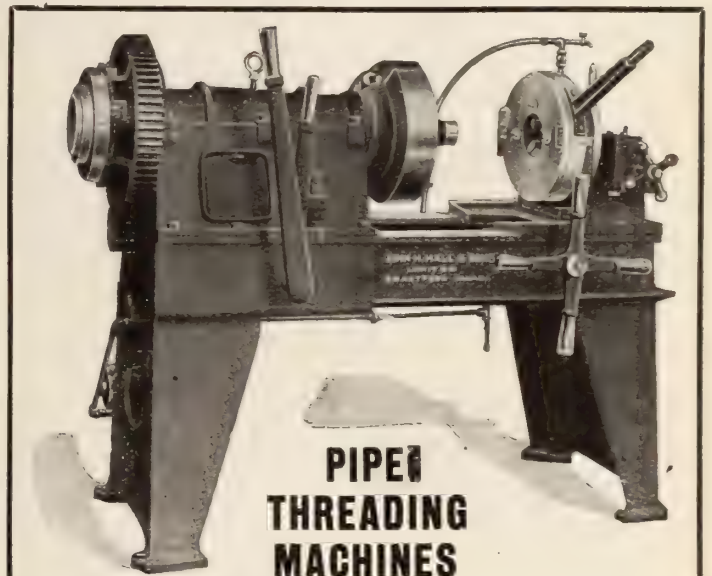
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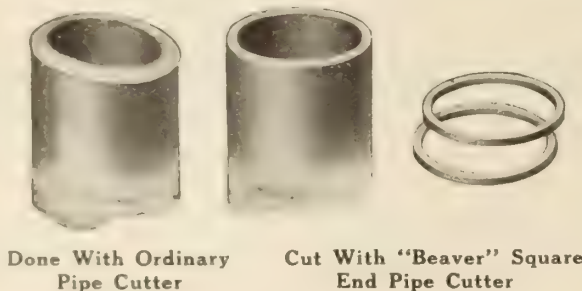
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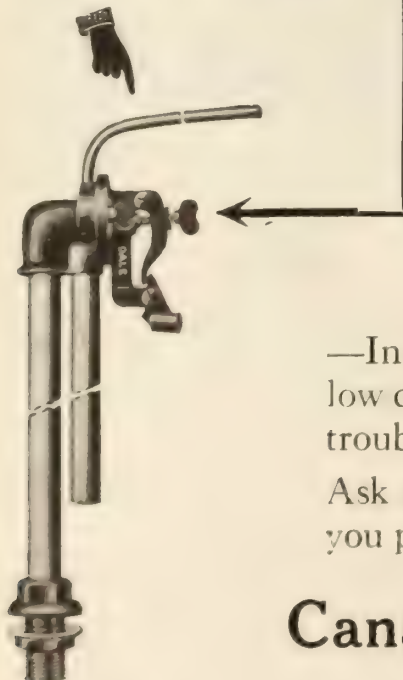
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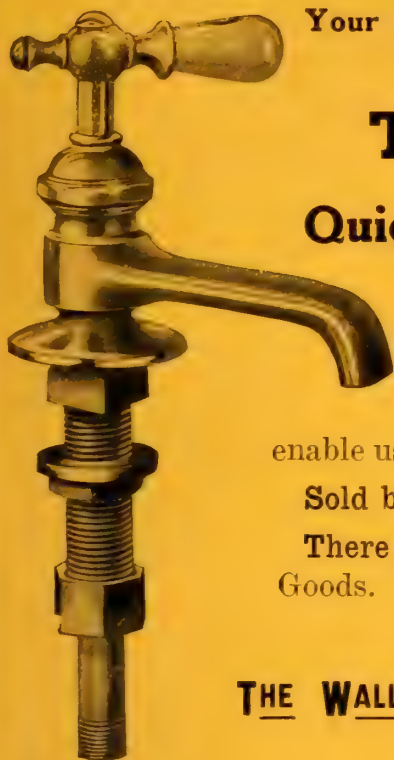
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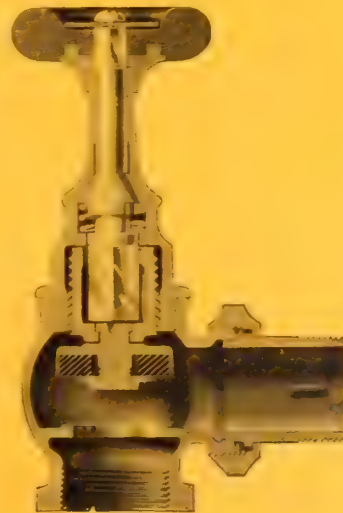
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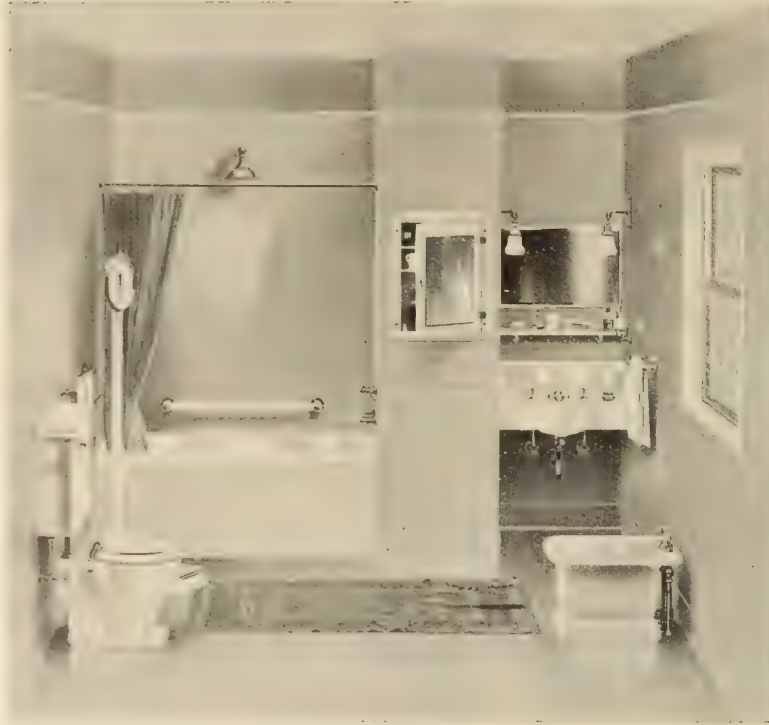
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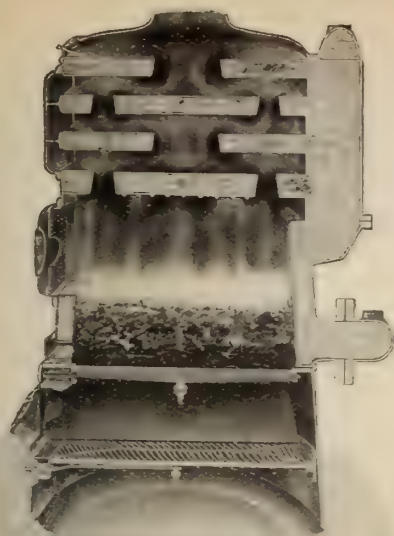
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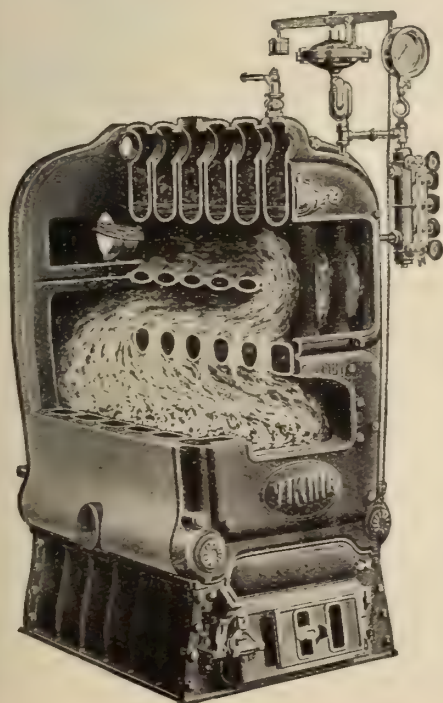


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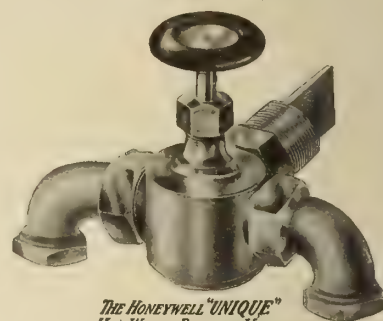
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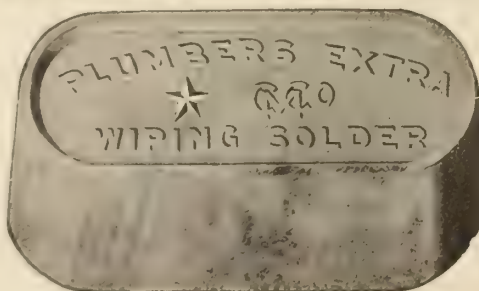


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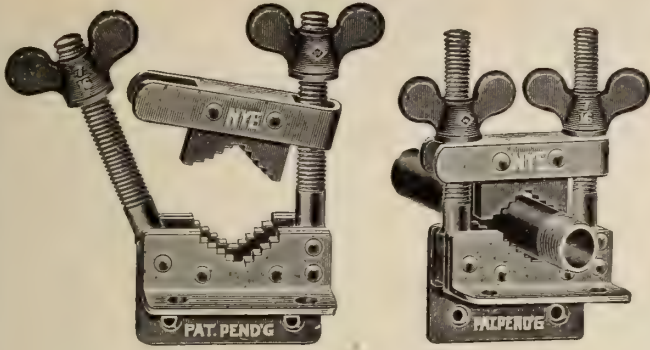
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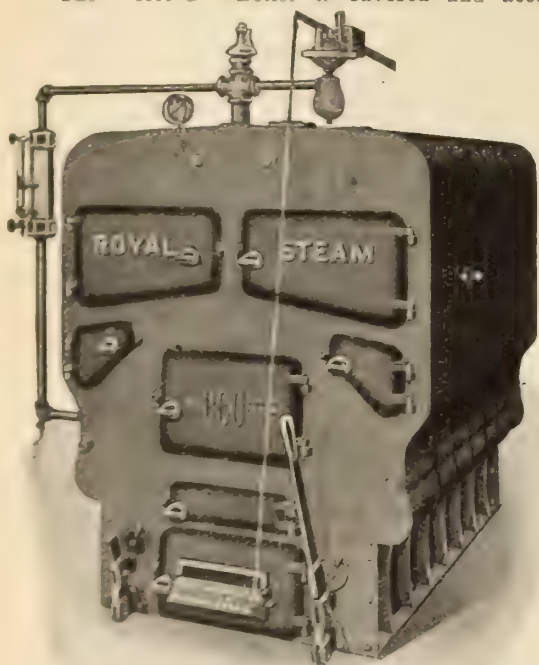
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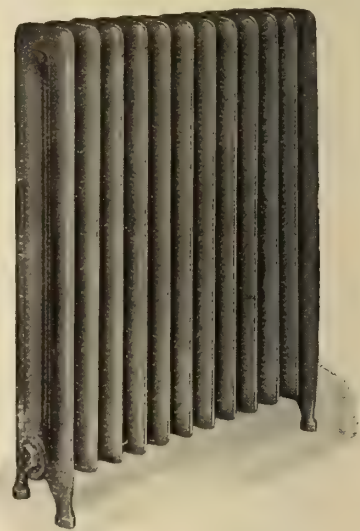


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Opinion of Three Cities re Main House Trap

Trap Proved a Necessity in Toronto and Winnipeg — Ottawa Chief Inspector Would Discard it Altogether—Further Discussion on Decisions Arrived at Recent Western Convention.

The decision given against main house traps at the first convention of sanitary inspectors and sanitarians held in Western Canada last month, has aroused much discussion and criticism. Following are some of the opinions as expressed:

Ottawa Inspector Opposes House Trap.

James Jacques, chief plumbing inspector, Ottawa, when interviewed by The Sanitary Engineer re main house traps, stated: "In Ottawa, if I had my way, I should cause the main house trap to be discarded altogether, and further where tile drains are in use and the main trap in existence, I would have traps all removed and straight lengths inserted in their places. There might, however, be conditions where it would be desirable to use a main house trap and so in drafting a uniform code for one or more provinces, I would have recommended that no definite ruling be given, but this be left an optional matter."

J. McKinley, of Ottawa, was also in favor of dispensing with the main house trap. He stated that personally he had never come across a condition where it was absolutely necessary, but in spite of that he thought it should be optional with the man installing the job. J. T. Blyth, also of Ottawa, further concurred in the opinion as expressed by Mr. Jacques and Mr. McKinley. Taken as a whole, the opinion of the trade in Ottawa was opposed to the installation of the main house trap.

Toronto Proved Main Trap a Necessity.

"This decision reached at the Winnipeg convention is a step decidedly backward," stated Wm. Meadows, supervising inspector of Toronto City Plumbing Department. "On the coast, leaving off the main house trap may work out all right, but in any section where there is much zero weather I am convinced that the trap is necessary. We tried doing away with the trap in Toronto, but the month of zero weather which we had early in 1912 firmly convinced us that the trap was absolutely necessary."

With no trap things were found to work out something like this. In zero weather moisture froze on the inside at the top of the venting stacks and finally blocked them up altogether. Upon the flushing of a closet or emptying of a bath or basin, the rush of water caused the syphoning of every trap in the house, and as there was no main trap to leave any final obstacle between the house and sewer, air from the sewer entered freely so that the odors from the sewer per-

meated throughout the whole house. "For two whole days," states Mr. Meadows, "I sat at the 'phone doing nothing but answer inquiries from both plumbers and householders alike as to what could be done to remove the terrible odor from their homes. The only solution, and it only a temporary one, I explained, was to go up on the roof and thaw out the top of the stacks. In no case did I have further complaints after this was done."

This one experience proved enough for plumbing inspectors in Toronto, and since then they have always insisted on a main house trap being installed on every job.

Trap Found Valuable in Winnipeg.

At the convention, Jas. Smith, chief plumbing inspector Winnipeg, expressed his opinion thus: "For a number of years main house traps had been optional in our city, but finally owing to complaints from sewers and drains being choked up by frost, and from expense incurred and annoyance to citizens, in keeping these open, we decided to make them compulsory. We found that where there was no main trap, in zero weather the currents of air induced by the venting stacks through the houses caused an equal volume of fresh air, at outside temperature to enter the sewers through the manhole covers in the streets. This cold air lowered the temperature of the sewers and caused moisture and drainage to freeze over the sewer connection where it entered. Expenses were decided to make the installation of the house trap necessary and thus prevent currents of air from circulating through the systems." Mr. Smith admitted that unsanitary conditions did arise out of house traps being introduced, but was of the opinion that evils attending the omission of the trap were even greater.

But whatever the ruling of inspectors in the East or Winnipeg would have been, the West as a whole has decided that so far as they are concerned no main house trap shall be used. For half the Dominion to rule out such a fixture is a very decided move, and sanitarians all through the East are awaiting results with great interest.

Speaking further on the question of a uniform code Jas. Jacques, Ottawa, stated: "In every ordinance there should be one clause inserted stating that plans of proposed work shall first be submitted before any permit be granted by the Health department, and the public should be informed of the existence and significance of such a clause.

In Ottawa we find a number of jobs being done altogether without the knowledge of the Health office. In many cases, while not exactly unsanitary, these do not conform with the by-laws, and in such cases we have great difficulty in finding who installed them. Such a clause, I think, would relieve matters greatly and tend to more sanitary conditions at less expense, as it would do away very greatly with the necessity of causing an installation to be even partly torn out and done over again."

"Every municipality should have a plumbing by-law, and in cities such as Ottawa, Montreal, Toronto or Winnipeg there should be a staff of sanitary engineering inspectors—for Ottawa at least six. "These men," stated J. T. Blyth, should each be assigned different routes, and be transferred from one district to another at the end of stated periods, say six months. Taking careful note of all that came under their inspection they should compare notes, and in case of finding unsanitary conditions, should condemn the job and cause it to be righted at the expense of the man who installed it or caused it to be installed. This would rapidly do away with shoddy work and bring about only such work as would do credit to the high title of "Sanitary Engineer."

Mr. Blyth was also of the opinion that the number of inspectors should be increased for educational purposes. Many circumstances arose where a tip to a journeyman would be very valuable and his idea was to make of the inspector a consulting engineer to whom access would be free at all times.



CATALOGUES AND BOOKLETS.

The E. S. Manny Co., Manufacturers of the Manny Heaters, Montreal, Que., have recently issued to the trade their Catalogue F. describing the Manny system and showing by illustrations the different ways of installing Manny heaters in connection with medium steam pressure, low pressure, and vacuum system service. The booklet also contains cuts of many large buildings in which the system has been introduced successfully, and testimonials showing the standpoint of the owner. By half-tone too many special machines used in the manufacturing of Manny heaters are shown. The booklet is gotten up altogether in very attractive form and for those in the trade contains much valuable information.

Two London Members Make First Bequest

J. Eggett and B. Noble Start the Ball Rolling With Round Sum of One Hundred Dollars—Action Towards Forming Permanent Headquarters for Ontario Society in Toronto—Committee Proposes a Joint Stock Company, Shares to be Held by Members Only.

J. Eggett and B. Noble, both of London, Ont., have been the first to start the ball rolling towards an endowment fund for the Ontario Society of Domestic Sanitary and Heating Engineers, together having contributed the sum of one hundred dollars. Commenting upon this bequest, Secretary Frankland states: "This starts the ball rolling, and from now on you will see that our society will become one of the strongest of its kind in the Dominion."

When E. H. Russel, of London, at the annual convention held in March, brought in the recommendation on behalf of the London committee "that a form of endowment be appended to the constitution and by-laws for the purpose of forming an endowment fund" the idea was generally scoffed at. President LeGrow made the explanation that this would simply be a motion put through allowing any member to bequeath \$500 more or less to the society, and upon this explanation the motion was heartily concurred in. Mr. Russell then assured the members that funds would be forthcoming. This gift from J. Eggett and B. Noble is the first fulfillment of the pre-

diction, and will doubtless be only a "starter."

Action has already been taken towards a permanent headquarters for the Ontario and Toronto societies by the committee appointed at the annual meeting (made up of L. LeGrow, Wm. Mansell and F. R. Maxwell) and the Toronto committee, working in conjunction. These have decided to issue a prospectus outlining their intentions in connection with this project, and also blank forms for subscriptions to ascertain the number of shares that members intend buying up. Upon receipt of some definite information with regard to the way in which the idea of a permanent headquarters is welcomed from a financial standpoint, the committee will apply to the Ontario Legislature for a charter for the Ontario Club of Domestic Sanitary and Heating Engineers. In order to hold a property in value of more than \$10,000, this course is necessary and also advisable in order to remove the responsibility from the Ontario society.

The members of the committee desire that the various members of the association give the matter careful consideration and inform them early as to their intentions in this connection.

Health Officers and Medical Doctors

Man Proposed as M. O. H. for Ottawa Asked to Pass Theoretical Examination—Practical Side Omitted.

The Ottawa Citizen in a recent issue dealing with the appointment of T. A. Lomer, as Medical Health Officer of that city, says:

Ottawa's new health officer, T. A. Lomer, M.D., C.M., D.P.H., of McGill University, who has taken special courses in pathology and bacteriology, as well as the diploma of public health which latter degree is the one which qualifies him for public health work—has got to pass the medical examination of the Ontario Medical Council before he will be eligible to accept the position of M.H.O. of this city. The Public Health Act of Ontario stipulates that only legally qualified medical practitioners may be appointed health officers in Ontario municipalities. To become so qualified it is necessary to pass the examination of the provincial medical hierarchy. In

the case of prospective public health officers, however, this examination has no value whatever either to the man who writes on it or to the public whom he wishes to serve. While this test may enable the Ontario Medical Council to ascertain whether or not the young medical graduate is qualified theoretically to treat individual patients, it can not reveal the fitness or otherwise of the prospective public health officer for the reason that the latter's work has to do with the maintenance of conditions which prevent disease and not with the treatment of individual sickness. The provincial government has given the Ontario medical hierarchy this extraordinary power over the municipal health departments on the assumption that private medical practise and public health work required the same qualifications. As the result

of this regulation in the Public Health Act no municipality in Ontario has a properly qualified public health officer, but they all have legally qualified medical practitioners and most inefficient public health services. Now that Ottawa has an opportunity to secure a qualified health officer, the provincial medical hierarchy says the city can't have him unless or until he "joins the union."



MEDICAL HEALTH OFFICERS WILL CONVENE.

The second annual meeting of the Ontario Health Officers' Association will convene at the Parliament Buildings, Toronto, on Thursday and Friday, May 29 and 30.

Amongst those who will address this meeting are G. C. Whipple, Professor of Sanitary Engineering, Harvard University; Dr. Chas. J. Hastings, Medical Officer of Health for Toronto; and Lieut-Col. Lowrie, of Port Arthur. As all medical health officers are under obligation to attend, an attendance of some 850 is expected. Many subjects of interest to sanitary engineers will doubtless be discussed.



PRESIDENT OF CANADIAN COMPANY.

Edward L. Dowes, who since the organization of the Standard Sanitary Manufacturing Co., has acted for the company in the capacity of general manager of factories, has lately resigned from that position to assume actively the presidency of the Canadian branch, the Standard Sanitary Manufacturing Co., Ltd., of Toronto. Owing to rapidly increasing business the Executive Committee thought it wise to have a member of their committee a permanent resident of Toronto, so as to be better able to direct the Canadian business. Coincident with this change the executive committee made the following appointments: Wm. C. McKinney general manager of factories; Henry M. Reed, assistant general manager of factories; John C. Reed, consulting engineer; Theodore A. Mueller, manager of the Ahrens and Olt Works.

All of these men have been actively employed in the service of the company for a number of years.



MacLeod, Alta.—A new plumbing by-law for this city has been drafted and has already been brought up before the city council for judgment. Only a few important changes have so far been made and it is likely that the by-law will be passed and go into force shortly.

Systematic Method of Making Collections

**Tightness of Money Requires More Careful Attention to Past Due Accounts—
Send Out Statements Regularly—Collect Where Possible on the Job.**

Ever since the first of the year there has been much talk about tightness of money and difficulty in making collections. These expressions have become once more proverbial, and are so true that with some business firms they cannot be passed over lightly. Collections have undoubtedly been in a bad shape, and though there are now some signs of conditions letting up a little, still that is all the more reason why greater efforts than ever should be put forth to settle up accounts of both long and short duration.

Jobbing houses realize the condition of the money market and are becoming strict in proportion, refusing to sell on any but a cash basis, or even to deliver goods under any conditions where they consider that circumstances warrant such procedure.

First as a matter of business principle and second to meet the more urgent demands of the supply houses, it is essential that every sanitary and heating engineer at once launch a campaign (provided he has not already done so) to systematically collect all accounts both of long and short standing.

Collecting Accounts Through a Series of Letters.

For some time past a certain Toronto firm followed up with much success the policy of sending out a series of four letters urging payment on the part of all slow pay customers.

These letters, all of which are reproduced herewith, start with a gentle reminder drawing attention to the fact that in order to carry on the business successfully some ready cash is necessary, and urging in a polite way that settlement be made. The second letter is more severe, but deals with the matter

in a polite, but firm manner. Increasing in severity, the third and fourth are designed to bring about payments from those who have wilfully neglected the first two appeals. Such people require a good stirring up, and for this purpose these last two letters have been mapped out.

These letters, it might be stated, are used solely for dunning. They are sent to people who have let their account run unheeded for three to six months after statements have first been rendered and who the firm know little about. Never are they sent to old established customers who, though possibly slow, are known to be in good terms financially and will settle at some definite understood period.

Itemized Statement at First of Month.

Itemized invoices are sent out promptly on the first of the month, following the completion of the job, or if the customer is not known, quite often the policy adopted is to send out statement as soon as the job has been completed.

Time of Sending Out Letters.

Where no attention is paid to the itemized statement, after three to six months the letters begin. No. 2 follows 15 to 20 days after No. 1, and 3 and 4, at about the same intervals after No. 2 and 3 respectively.

In a great number of cases the first letter is all that needs to be sent. Customers come to pay their accounts and comment upon having received a reminder. In very few cases, the book-keeper states, is any offence taken from these letters. The first one is so mild that no offence is given. Those who let the first go by are not the kind of people who take offence at a dun.

Settling Complaints.

Quite often those who have received two or more letters come making the complaint that the installation has not been properly made. Such complaints should all be made at the time the invoice is sent out and not after several months have elapsed. In dealing with a kick, however, the policy of the firm is to send up the man who did the job. He knows what has been done and is the best to straighten out any complaint which may arise.

Very often when a family is moving they send to have the stove disconnected. In such cases an attempt is made to collect payment right on the job so as to avoid difficulty through change of address. The new address of a customer is also secured.

Willing Pay When Case of Necessity.

A parallel instance is that of leaking or bursted pipes. Then the customer has to have a plumber and will pay \$2 quite willingly right on the spot just to have the leak mended. But if an account of 75 cents is rendered two months after he is apt to think it outrageous robbery, call down the plumber and refuse to pay.

Summary.

Summing up there are a few points which need to be noted. Collect where possible on the job so as to avoid future difficulties. Send out statements regularly, and soon after the completion of the job so that complaints arising may be immediately settled. Collect persistently, but do so in a polite inoffensive manner, and collect always never allowing a chance to fall in arrears except in cases where there is a definite and safe understanding.

(1)
.....
.....19..
M
.....
Dear.....

Requiring to use a large amount of money right now, it is found necessary to collect in some ready cash and this request is being made of you along with others. What you can do in the way of assistance at the earliest possible date will be highly appreciated. Please do what you can and oblige.

Yours truly,
.....
Amount due \$.....

(2)
.....19..
M
.....
Dear.....

If requests for settlement are sometimes expressed more plainly and vigorously than at other times, it is because business requirements prevent the prolonging of credits. Your indebtedness is past due. You have been given a long time, much longer than was agreed upon, and present circumstances are such that your assistance is much needed. Please give this your immediate attention and oblige,

Yours truly,
.....
Amount Due, \$.....

(3)
.....19..
M
.....
Dear.....

In further reference to the matter of your indebtedness it has become necessary to remind you that it is still unpaid. There is no wish to make you any cost, but it must be insisted upon that this claim be settled at once. It is not desired to crowd you and nothing more is asked of you than necessity demands. Please be prompt,

Yours truly,
.....
Amount Due, \$.....

(4)
.....19..
M
.....
Dear.....

You have been repeatedly asked for a settlement, but seem to have given these requests no attention. If the amount is not paid, or in some way adjusted in the next 10 days, you can blame yourself if such proceedings are entered as will collect it. Please save any trouble,

Yours truly,
.....
Amount Due, \$.....

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabck, London, Eng.

JOHN BAYNE MACLEAN, - President
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TORONTO, MAY 15, 1913

Introduce Universal Standard

The progress toward making compulsory the passing of some standard examination before a mechanic is permitted to hang out his shingle as a fully qualified sanitary and heating engineer may be slow, but the end appears inevitable. That setting such a standard is a wise and necessary move, there is little or no doubt. If advancement is to be made in any trade, there must be a standard of some kind to which men must attain before they are allowed to carry on business and which will set a dividing line between the layman and the skilled mechanics.

The old apprentice system has been an excellent one in the past, but would appear to be losing its hold on the youth of to-day, who, on an average, is not satisfied to be tied down for a term of five years to one master and receive only slight remuneration. Undoubtedly, masters can do much by taking an interest in their helpers, supplying them with tools and technical books, giving them some experience in drawing and figuring on jobs, and placing them with the most thorough and most intelligent journeymen. But how many are willing to do this? A great number would sooner "buy their plumbers ready made" than bother putting green boys through their training.

Then there is the future of the technical school to consider. Jas. R. Haslett, of London, in his paper on "Technical Education as it Pertains to Plumbing," presented at the annual convention of the Ontario Society, pointed out the value of the technical school in giving boys an actual interest in their work, which would make them look beyond the time of simply cutting threads and lead them to find out definitely the why and wherefore of every movement.

Associations are drafting lists of questions which they will make it necessary for outsiders to answer successfully before they are admitted to the society. These in general deal with subjects pertaining to the craft and to the successful financing of any sanitarian's business.

Then there is the municipality which is also making the passing of an examination necessary. Already Calgary, Edmonton, Port Arthur, Fort William and New Liskeard as municipalities require that every sanitarian coming to carry on business in those places pass an examination to receive a diploma which will serve as a passport into the ranks of those who do mysterious things with lead and weird-looking tools.

These all herald the day of universal examinations. Commencement has already been made in the municipality. The Association and technical school each spread the system a little farther. The final result appears inevit-

able. Why not introduce one standard now for a whole province or the Dominion, instead of first having a hundred standards set up, and then reducing to one later?

Practical Knowledge is Essential

The Public Health Act of Ontario provides that only a legally qualified medical practitioner may occupy the office of medical health officer in any Ontario municipality. To become thus legally qualified, as stated elsewhere in this issue, requires the passing of a theoretical examination dealing with the ease of the individual and not the family or nation. 'Tis true that before going into office it is necessary for the applicant to secure a diploma of public health. But in how many cases does this amount to much more than a bunch of red tape?

The duties as performed by the average M.H.O. consist chiefly in posting up, or removing a placard from a home in which some dangerously infectious disease has broken out, and in disinfecting the home after the recovery of the patient—both of which are tasks which the man of average intellectual ability can perform. These become the duties of the average M.H.O., simply because he knows practically nothing of the practical and technical side of his profession. He is not a man fit to look into conditions, determine whether a sewage system is healthy, a plumbing system properly installed, a certain fixture capable of performing the duties for which it is intended, or any of the hundred and one other things which crop up in the profession of the sanitarian.

And yet these men are placed higher up in the scale than the man who has devoted his life to the study of practical sanitary conditions for the prevention and extermination of diseases.

Why not combine the theoretical and practical? The medical practitioner knows the subject of prevention and cure of individual sickness; the sanitarian deals in a practical scientific way with the health of the community and nation. Could not the combining of these two forces produce one force which would advance the trade standard and health standard of all our cities? The government does not provide a school for educating the medical officer to a practical treatment of national sanitary problems as confronted by the sanitary engineer. Then why not have the sanitarian and medical practitioner work together for the common benefit of the public at large. This step has been introduced in the districts into which the province has been divided. Why not make an advance in the same direction in every municipality?

Sanitation and House Fly Extermination

Standpoint Taken by Medical Doctor as to Only Sure Method of Getting Rid of the Pest—Advocates Eradication of Unsanitary Conditions From Which Fly Gains its Maintenance—How Plan Worked out in Cuba.

The following article written by J. W. Hodge, M.D., for the Niagara Falls Gazette, presents the standpoint taken by a medical practitioner on the swat the fly question:—

The fact that flies carry germs on their feet just as other insects do is no valid reason for believing that germs are the *causa vera* of diseased conditions of the human body.

Even if it could be proved that so-called "disease-germs" are the specific etiological factors in the production of infectious disease and that flies by carrying these germs on their feet transmit disease-germs from the sick to the well, it would still be the height of folly, stupidity and absurdity to "swat the fly" in the hope thereby of preventing the spread of disease. It is a well-attested fact that house-flies are scavengers which have their habitat in **unsanitary surroundings**. They thrive and propagate under untidy and uncleanly surroundings. They are filth-eaters which subsist mainly upon refuse which they find scattered about. These pesky guests come around during the heated season for the purpose of cleaning up refuse which they find lying around the kitchens of untidy households. Filthy surroundings and mal-odorous smells from decomposing animal and vegetable matters are the principal attractions of house-flies.

Just as the presence of carrion attracts vultures, turkey-buzzards, and other birds of prey so do foul smelling and filthy domiciliary premises attract house-flies and supply them with sustenance and breeding haunts.

The presence of swarms of house-flies in a household or elsewhere is unmistakable evidence of faulty house-keeping and **unsanitary premises**. By removing filth, refuse and loose food upon which house-flies depend for sustenance, a house-keeper can expel the house-fly which will depart to other and more congenial quarters.

The rational and effective means whereby to eliminate these household pests is the cleaning-up process. Keep the household and the surrounding premises sweet and clean and there will be no work for the house-fly scavenger to do; but so long as there are filth, refuse, and exposed food lying about, the house-fly is a necessary and useful scavenger whose mission it is to remove accumulations of filth. A house-fly is a sanitarian. To engage in the stupid, cruel and senseless undertaking of "swatting the fly" while at the same time neglecting to clear away the baits which invite his presence is the height of folly and the very acme of inconsistency and asinine stupidity on the part of those persons who engage in such a quixotic enterprise. For the popular food-slogan "swat the fly" let householders substitute the rational and effective pre-

ventive measure of swatting the dirt and removing the filth which attract and feed the flies. I have never endorsed, nor have I taken any part in the popular craze over swatting the fly. I regard the persons who are engaged in this fool-movement as fit subjects for the services of an alienist.

To attempt to banish the house-fly from filthy households is as senseless as it would be to drive buzzards and hyaenas away from carrion.

So long as filth remains in courts, alleys or household the services of the insectal scavenger, known as the house-fly, are as necessary as are the human scavengers who clean our streets and alleys of garbage and filth. What would be thought of the sanity of a person who should attempt to banish frogs and tadpoles from a marsh by swatting the frog?

The only rational and effective method whereby the frogs could be eliminated would be the draining of the marsh and the filling up of the frog-ponds, which are the breeding haunts of those ranine amphibians.

It is amazing to see sane and civilized human beings of the twentieth century engaged in so senseless, cruel and futile an undertaking as the "swat-the-fly" movement has shown itself to be.

Previous to American occupancy the island of Cuba and the city of Havana were hotbeds of filth, yellow fever and mosquitos.

Visionary theorists and medical dogmatists did not hesitate to attribute the prevalence of yellow fever (a filth disease) to the pre-

sence of mosquitos on the island. With that fool-hypothesis as a basis a crusade in which "swat the mosquito" was the war-cry that was inaugurated and carried on by the government at great expense. After having squandered thousands of the people's dollars in this quixotic crusade against the "yellow fever mosquitos" without any appreciable decrease in the yellow fever epidemic, our government next instituted a thorough system of sanitation by removing the accumulated filth from the streets of Havana, installing a thorough system of sewage, purifying the municipal water supply, abolishing many thousands of cesspools and putting the island and the city of Havana in a sanitary condition.

Scarcely had this good work been accomplished when both yellow fever and mosquitos simultaneously took their departure from the island of Cuba which is now one of the most salubrious and healthful islands in the world.

The filthy cesspools, filth-laden streets and general unsanitary conditions in Havana previous to American occupancy had provided breeding places for yellow fever, typhoid fever and mosquitos.

These insects are merely concomitants of filth and filth-diseases and nothing more.



Now then all together—Toronto Star Weekly.

Heating and Ventilating in New Post Office

Details of These Two Systems in New York General Post Office Now Under Construction—Up-to-date Methods Employed.

The Heating and Ventilating Magazine recently states:

On the opposite side of Eighth Avenue, directly across from the New York passenger station of the Pennsylvania Railroad, stands, in an almost completed condition, the building which is to become New York's general post-office.

The edifice is constructed of Milford granite and possesses a massive and imposing exterior. It will probably be ready for occupancy early in 1913, at which time a large part of the business that is now handled in the present old post-office at City Hall Square will be transferred to this new location.

The building was designed by McKim Mead & White, New York, and is divided on the ground floor into a wide corridor for public use, located just back of the front colonnade, while in the rear of this corridor and in the basement, the space is mainly used for the sorting of



Fig. 13.—Method of making joints in
galvanized iron ducts with 4
sq. ft. or more area.

mail. Behind the building is a private driveway where mail wagons can drive up and load or unload their contents unhampered and without interfering with the street traffic. The entire structure is supported on steel columns carried down to the Pennsylvania Railroad tracks (which run directly under the

building) with mail platforms and lifts for loading and unloading the mail from the trains.

On account of the extent of the heating and ventilating system for this

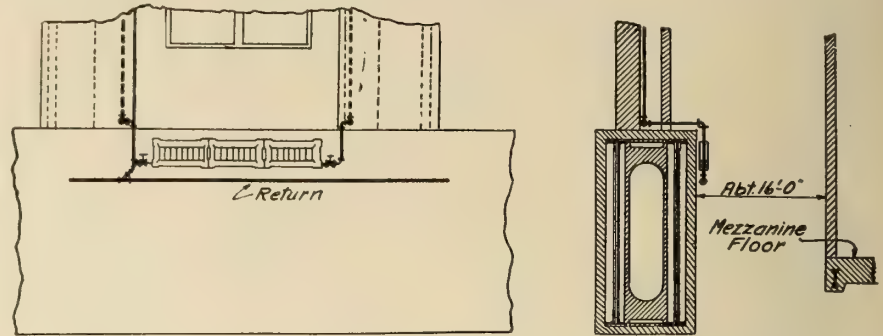


Fig. 12.—Typical wall radiator connections on east and west wall mezzanine.

building, the illustrations given are devoted to details of the plant.

General Arrangements.

The heating system is designed to warm the east foyer, pavilions and main workroom under the court skylight on the first floor, together with the east rooms and pavilions on the second and third floors, by indirect heating; the balance of the building is heated by direct radiation. Steam is used to supply all indirect radiation and the direct heating between the glass roofs of the court; all the other direct radiation is supplied by hot water.

The warming of the air for ventilation purposes is accomplished by means of two groups of heaters, each of which is composed of a primary and secondary

heater, between which is placed an air washer. Each group of heaters is connected to two fans which draw the air in through the fresh air intakes and propel it through the distribution ducts to

the various points desired. A general arrangement of one group is illustrated herewith (Fig. 1).

For purposes of indirect heating, a portion of the ventilating air is reheated as it passes through the ducts by tertiary or third heaters, one of which is provided for the first floor foyer and pavilions, two for the second and third story east rooms and pavilions, and fifteen for the first floor court enclosure, or workroom. These tertiary heaters are shown in plan and elevation in Figs. 2 and 3.

The discharge of the vitiated air is effected by special fans which remove the air from the east foyer and discharge it into the east basement, discharging the air from the basement outboard. The discharge of air from the court outboard is accomplished by fans in the monitor roof and also by auxiliary fans discharging air from the court into the building platform space. In general, the ventilation of the remainder of the building (except the toilet room) is provided for by collecting vertical flues of sheet metal, which are located on the outside and court walls and which discharge air from all rooms and apartments (not otherwise provided for) into the attic space, whence it is driven outboard by two groups of fans. The arrangement of a typical group of air and exhaust ducts is shown in Fig. 4. The toilet room venting is largely cared for by vents in the fixtures which are connected to exclusive collecting pipes that lead to independent fans in the attic which discharge the air outside. A layout of one of the basement fan rooms No. 8, is given in Figs. 5 and 6, and a typical skylight ventilating fan is shown in Fig. 7.

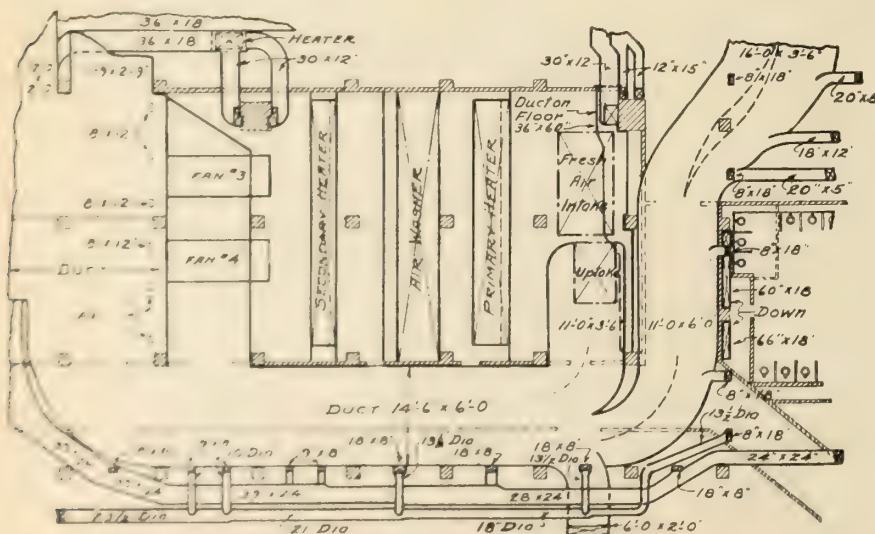


Fig. 1.—One of the heater groups, composed of primary and secondary heaters, air washer and fans.

The steam supply is furnished temporarily by the New York Edison Co., which in turn buys it from the Pennsylvania Station service plant from one of their station lines. It is the intention however, for the Edison Co. to build a power plant for this work in the near future.

A primary reducing valve is installed on the 8-in. high pressure steam main, where it enters the building which im-

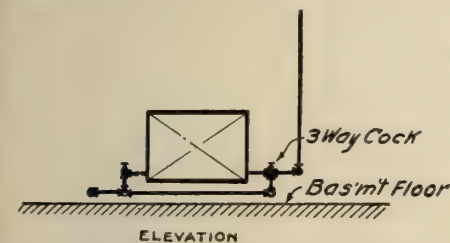


Fig. 8.—Typical basement radiator connections, north and south walls.

mediately cuts the pressure down to 50 lbs. per sq. in. and on each of the steam pressure branch mains is placed a secondary reducing valve which lowers the pressure from 50 to 20 lbs. These branches consist of the supplies to the primary and secondary heaters, the supply to the fifteen tertiary heaters beneath the court, the tertiary heater for the foyer, the tertiary heaters for fans No. 7 and No. 8, the supply to the hot water generators and the supply to the skylight coils. The reducing valves are all equipped with alarm whistles on the low pressure side combined with pop safety valve.

The steam supplies to the skylight coils are run to the under skylight space through air ways about the columns in the court and are connected by branch runouts having diaphragm valves and thermostatic control.

Throughout the piping system expansion on both steam and hot water lines is provided for by expansion loops as far as possible, and all pipe was cut of such length as to produce a tensile stress in the pipe (when erected cold) equal to the compressive stress produced (when hot) under conditions of maximum service.

The overhead condensation return piping is designed for open drainage service, having (for this purpose at the ends of all runs and at intervals of about 60 ft. throughout the length of the return runs) tee fittings for 1-in pipe with the centre top outlet looking up. Into each of these outlets is inserted a 1-in. vertical pipe about 12 ins. high, with a swing check at the top, which opens inward and has the tongue hanging perpendicularly when free. This is

for the purpose of admitting air to follow and break up any flow of water in "plugs," thus preventing hammering and also all outward flow.

Condensation returns are run into a receiving tank 60 in. in diameter and 96 in. long, have $\frac{1}{4}$ in. thick boiler iron shell and $\frac{3}{8}$ in. wrought-iron coneave head.

The two discharge pumps are of the volute pattern with 2 in. discharge nozzles, running 1200 R.P.M. and driven by a direct-connected 2 H.P. motor, pumps and motors mounted on a single cast-iron bed plate set on a concrete foundation.

The 2 in. vapor pipe from the receiving tank is run through a condenser consisting of a cast-iron tank 24 ins. diameter and 60 ins. long with

flanged ends and bolted convex head plates, one of which is bored at the bottom for a 5 in. cold water infeed connection and the other at the top for a similar size tempered water outlet. Inside of this tank is placed a trombone coil of heavy 1 in. copper pipes, and the tank is so suspended in a horizontal position above the receiving tank that the branch manifolds are in a horizontal position. The 2 in. vapor line is run into the lower manifold top forcing the vapor through the coil and out of the top manifold top to the pipe leading to the atmosphere. The top of the condenser shell is air vented and a 12 in. drain pipe is connected to the bottom. The cooling water used is the cold water supply on its way to the hot water service heaters.

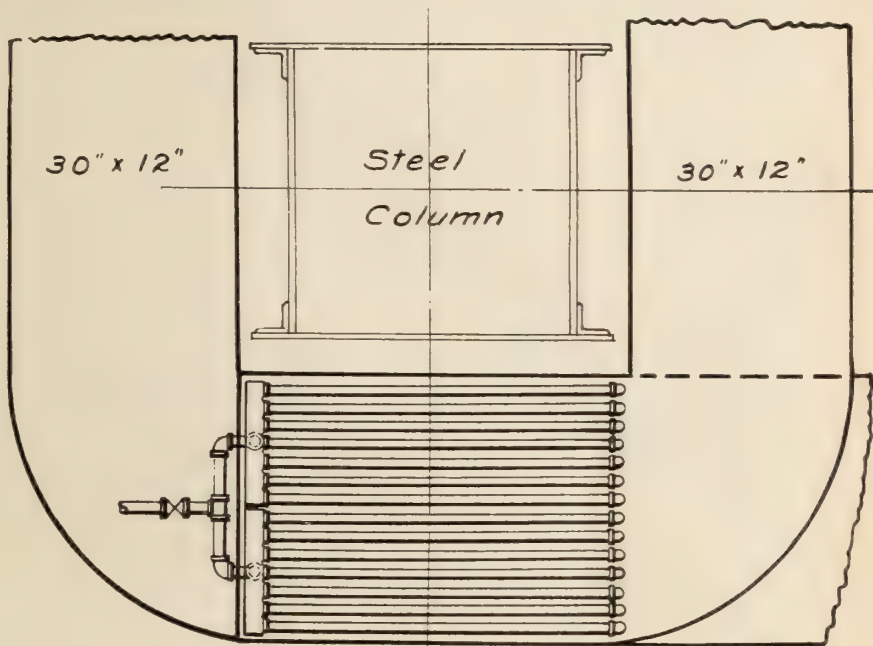


FIG. 2.—TYPICAL PLAN VIEW OF TERTIARY COILS.

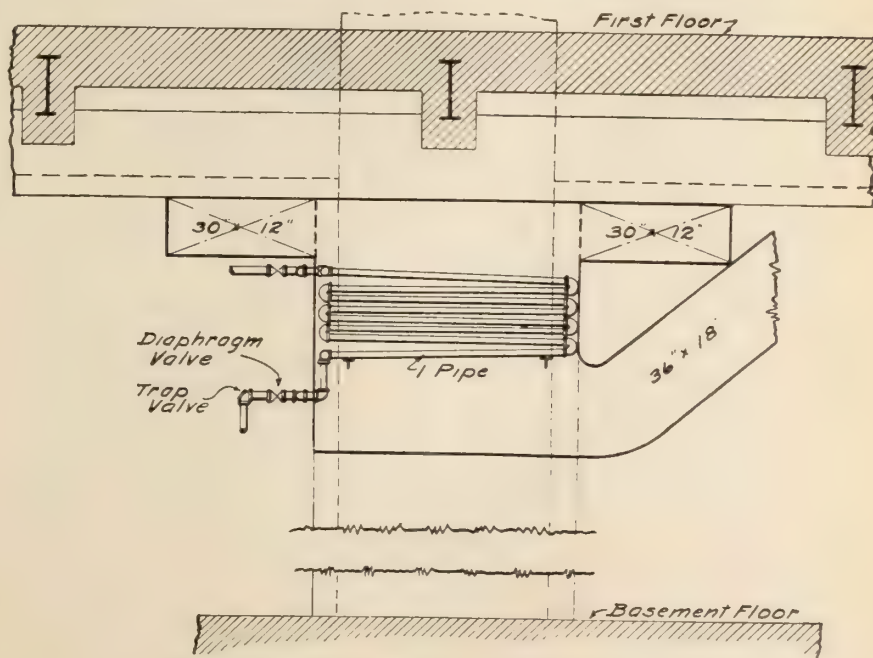


Fig. 3.—Typical elevation of tertiary heater.

Direct Hot Water System.

The hot water radiation is supplied by two hot water generators, heated by steam and each generator is connected to the discharge of a centrifugal circulating pump. From these pumps and generators, the heated supply is carried up to the attic where it is distributed horizontally to the vertical drops which are carried down the inner faces of the outside and court walls connecting to the hot water radiators as required, the chilled returns being continued on down to the basement where they are connected to the suction sides of their re-

spective circulating pumps to repeat the cycle of movement.

The two hot water generators are both of identical size and description, each having a capacity of heating 40,000 gals. of water per hour from 180 deg. to 200 deg. F. when furnished with steam at 10 lbs. pressure. They are of a vertical type, with a cast-iron shell serving as a steam chamber inside of which are placed pure copper tubes through which the water is circulated. Approximately these heaters are 10 ft. high over all, about 28 ins. diameter, and each contains about 400 sq. ft. of copper tubing exposed to the steam surfaces.

These generators have an 8 in. opening near the top for steam (with an 8 in. x 5 in. reducing flanged nozzle) and a 2 in. condensation drip connection near

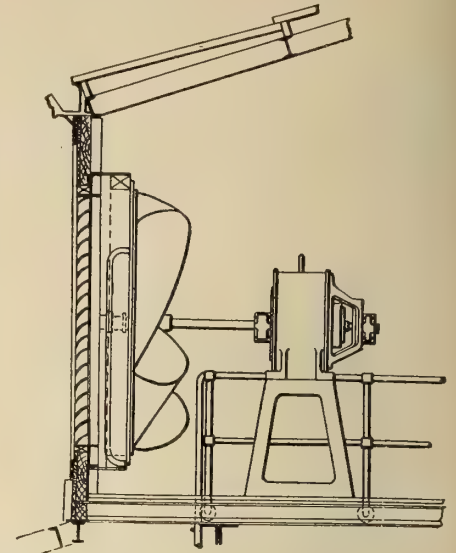


Fig. 7.—Typical arrangement of skylight ventilating fans.

the bottom. The water inlets and outlets are made with 7 in. x 5 in. reducing flanged nozzles. Safety valves are provided for excessive steam pressure relief, and 5 in. diaphragm valves are inserted in the steam supply lines.

The turbine circulation pumps have a capacity each of 700 gals. per minute, against a total friction head of 25 ft. and have the discharge ends connected to the inlets of the hot water generator. These pumps are motor driven by 10 H. P. motors, direct connected through flexible couplings. Both the pumps and motors are set on concrete foundations reinforced with three 6 in. I-beams set in mid-vertical position and running at right angles to the floor beams, so as to cover and bear on three of the structural beams, thus dividing the load between them, and the foundations are raised to pump discharge at the same elevation as the inlet into the hot water generators.

In general, the hot water piping is so graded that the air travel is uninterrupted by any obstruction except radiators in the entire run from the lowest points in the basement to the highest point in the attic. The main hot water riser and all the drops are securely anchored at the middle point; so as to make the expansion both upwards and downwards.

The feed drops on the hot water system are made with a Y branch tee at the top, the Y connecting with the branch main, the lower tap connecting with the drop and the upper tap closed with a plug in which is inserted an air valve. The drops are valved both at the top and at the bottom.

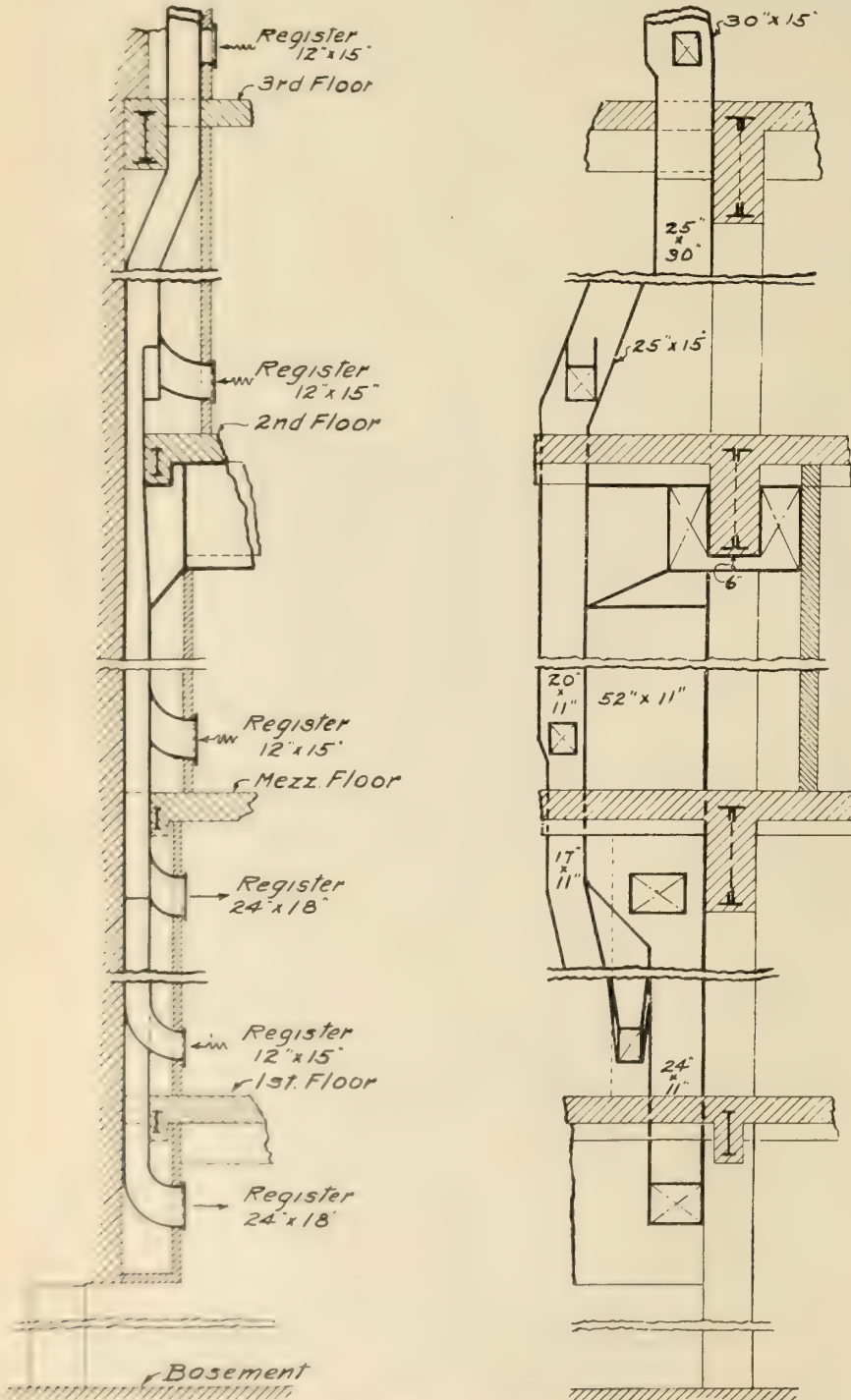


Fig. 4.—Typical arrangement of vent and fresh air flues around columns.

All the radiators used for direct heating are of the water pattern.

An expansion tank having a storage capacity of about 60 cu. ft. is connected to the hot water heating system. This tank is built of 2 in. hard pine planking, reinforced with rods and stays, and is lined with 18 oz. sheet copper, with locked and soldered points. The copper lining is extended above the top of the tank, is there turned over and tacked to the outside planking. The tank is supported on 4 in. I-beams, which are in turn carried by two 8 in. I-beams supported by the roof trusses. A 2 in. expansion pipe without valves is run from the 8 in. chilled water return main (near the suction end of the centrifugal pumps) to the bottom of the expansion tank where a heavy copper wire $\frac{1}{4}$ in. mesh basket screen is placed. The overflow consists of a $2\frac{1}{2}$ in. pipe brought into the bottom of the tank and terminated in a 6 in. 16 oz. copper funnel with a wired rim located so as to bring its upper edge 2 ins. below the top of the tank.

An altitude gauge is located in the hot water generator room and is connected direct with the expansion tank by $\frac{1}{2}$ in. pipe.

The water supply to keep the hot water system filled is of 2 ins. in size, and is brought from the house tank through a $1\frac{1}{2}$ in. centrifugal pump located near the expansion tank and operated by a $\frac{1}{2}$ H.P. direct-connected motor at 1080 R.P.M. delivering the water into the expansion tank through a 2 in. pipe with $\frac{1}{4}$ in. perforated holes and extended along one entire side of the tank. The operation of the motor and pump is controlled by a float switch adjusted so as to start the motor when the water falls to within 2 ins. of the bottom of the tank and to stop it when it rises to within 6 ins. of the top.

Drainage for the hot water system is taken care of by the connection of a $2\frac{1}{2}$ in. pipe into the lowest point of the main return, this pipe being run to the suction end of the 2 in. centrifugal pump which drains the south air washing tank (discussed further on) with a valve to allow the draining of the hot water system whenever desired. The drains from the hot water generators, primary, secondary and tertiary heaters are also run into this $2\frac{1}{2}$ in. drain pipe, with the necessary valves to allow drainage of any of these at pleasure.

Air valves are installed on the extremities of all steam mains; these being of specially large type to insure quick and sure action in air relief. These valves are vent-connected into the open returns, finally reaching the receiving tank. The 12 main returns from the primary and secondary heaters are also similarly vented. The water mains in the attic are vented through a 2 in. inlet

automatic lever and float air trap with copper floats and having a $\frac{1}{2}$ in. air vent pipe carried for discharge into the expansion tank.

The basement radiators are connected as shown in Fig. 8, and where indicated feed from a three-way cock valve of open flow-way pattern.

Temperature control is provided for the air passing through the primary, secondary and tertiary heaters and for the heating surface between the upper and lower glazing of the court skylight.

For this purpose there are used two electrically operated air pumps (each capable of compressing 10 cu. ft. of air at 30 ins. and 62 deg. F. to 5 cu. ft. at 60 ins. and 62 deg. F.), a compressed air reservoir of about 60 gal. capacity and other necessary apparatus. There is also a telethermometer placed in the

hot water generator room which indicates on a dial the temperature of the air entering the intake shaft, in the washer room, in the tempered ducts between the secondary and tertiary heaters in the uptakes for two of the fans water in the hot and chilled mains of the direct heating system, the air in the main foyer, in a typical room on the second floor east. This enables the operator to keep in touch with practically the entire heating and ventilating system without leaving the hot water generator room and gives immediate notice of anything out of the ordinary which affects the temperatures.

The heating and ventilation of this building was designed by L. M. Marks and J. E. Woodwell, consulting engineers, New York, and is being installed by Baker, Smith & Co., New York.

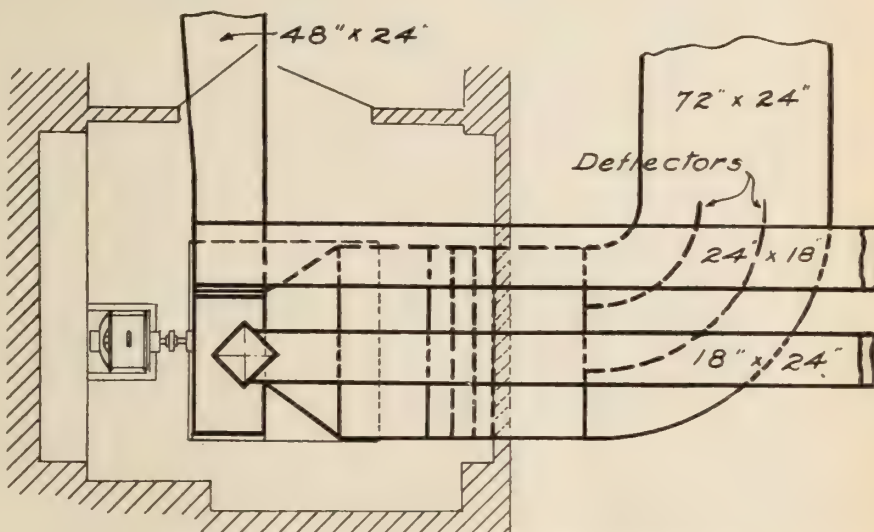


FIG. 5.—PLAN VIEW OF BASEMENT FAN ROOM NO. 8.

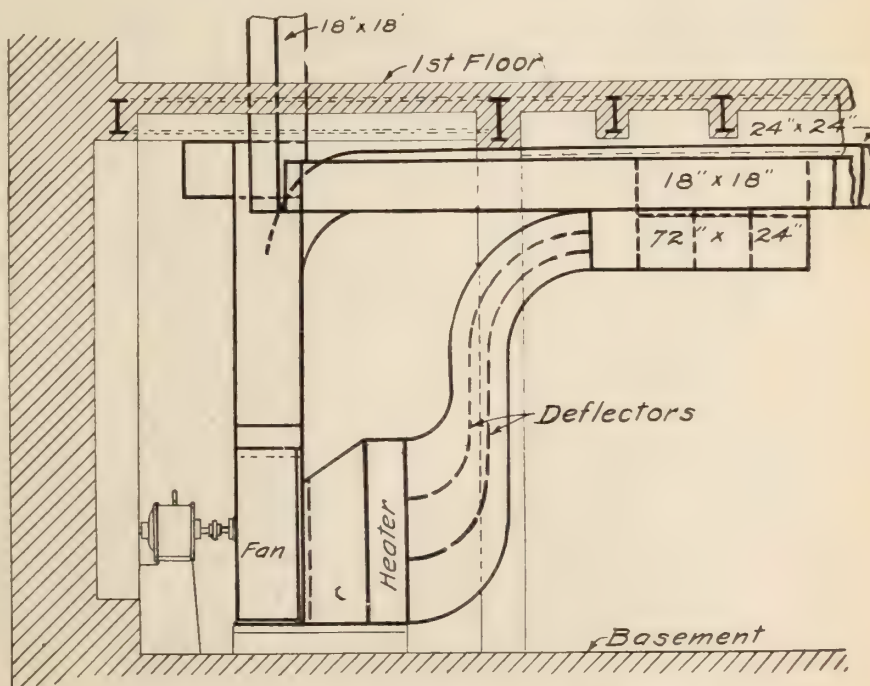


FIG. 6. ELEVATION OF BASEMENT FAN ROOM NO. 8.

How Plumbing By-Law Will Affect Trade

Rain water and Weeper Drain Must Be Connected on Sewer Side of Main Trap—Number of Fixtures on a Four-inch Stack in Apartment Houses Limited—All Closets With Vent Running Off Above Floor Ruled Out.

In the following article, material for which was supplied The Sanitary Engineer by Harry Hicks, of the Harry Hicks Co., Toronto, the workings of Toronto's new plumbing by-law are briefly explained, only such clauses being referred to as will materially affect any local plumber in installing a job after the by-law is put into force. Each clause referred to is given in full, so that readers can connect the clause and explanation in a satisfactory manner.

Weepers and Rain Water Form Separate Drain.

Clause 14 provides—All drains used for weeping and sub-soil drainage of any building must connect to main drain of building on sewer side of main trap and be so arranged that sewage will not pass or back into their trap.

That is, if weepers are put in in future, it will be necessary to run a separate drain for rain water. The purpose of this is to prevent weepers from filling up. If a drain plugs it generally blocks at the trap, and the muck flows back into the weepers, which have no means by which they can be flushed. With the new way, unless chokage takes place beyond the trap, which is very rare, the weepers cannot become blocked. The accompanying diagram illustrates the difference between the old and new way. Heavy dotted lines show rain water and weeper drains in new way. If weepers are not required the rain water can be drained into the house drain as before, but if there are weepers, then these with the rain water drain must be connected on the sewer side of the main trap.

Cleaning Trap with Two Hand-holes.

Clause 8 states—Between the building and the public sewer or drain there shall be placed a ventilation hand-hole cleaning trap of approved description and make.

This cleaning trap of approved description has not as yet appeared on the market, but is specified as one having two hand-holes so that the trap can be cleaned out from either side. Previously this trap had only one hand-hole. It is understood that the main trap will go on all drains whether of iron or tile.

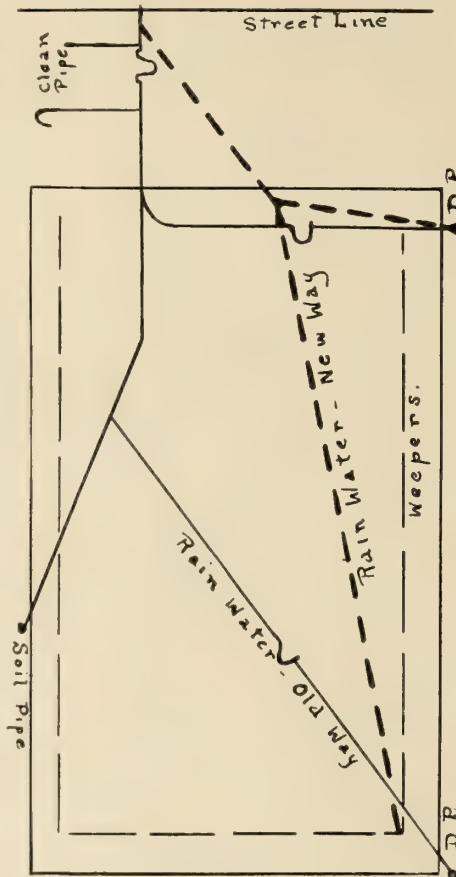
Clause 12 specifies that all drains shall have a fall of not less than one-quarter of an inch to the foot. On this point Toronto sanitarians asked for less fall, and were granted it in special cases, but in these cases it should be

compulsory that the sanitarian have the owner sign a document.

Refrigerator Drains Shall Not Connect With Rain Water Drains.

In clause 23 it is specified that refrigerator wastes, if drained, shall terminate and discharge either into an open sink, which is supplied with city water, or an opening used for draining of cellar floor surface.

In other words, refrigerator drains cannot be connected into any rain water



drains, but may be allowed to drip over gratings in the cellar floor.

Limits Number of Fixtures on a 4-inch Stack.

Clause 29—No soil pipe of 4 inches in size shall receive or have connected to it the discharge of more than four floors of any apartments or flats building; each floor must not contain more than two W.C.'s, four baths, two basins, two sinks, and two sets of laundry tubs. Main vent pipes for this or similar cases must be increased one size below roof, and pass out separately through roof.

This clause is for the purpose of barring such cases in flats or apart-

ments as where bathrooms of four apartments are so arranged as to be all around one centre, and emptying into one stack. In such a case there could be from four floors sixteen bathrooms on one stack, and, as these would be used all about the same time, a four-inch stack was considered of insufficient capacity. In apartment houses, therefore, which have more than the number of fixtures specified in the clause above, it will be necessary to increase the stack to 5 inches, when any number may be connected up with it. This clause does not apply to hotels or office buildings so far as the number of fixtures allowed on one stack is concerned for the reason that, though there may be more than the number specified on a four-inch stack, fixtures in such cases are not used nearly so frequently, or so many at one time, as in an apartment, and thus there would not be the same volume of sewage to be passed out by the one stack.

Footings of Medium Weight and Untarred.

Clause 31 states in part that all cast iron drains used underground shall be extra heavy and must be coated with asphaltum or tar supplied hot.

This clause does not include footings on soil pipe, which may be medium footings as before and untarred.

Clause 37 provides that when a system is to be installed for soil and waste pipe, it must be either entire galvanized wrought iron, or entire cast iron, but must not be part galvanized wrought iron, and part cast iron.

This does not prohibit cast iron drains being used where the Durham system is installed throughout the building.

Richelieu Closets Ruled Out.

Clause 43—No slip or washer joint shall be allowed on sewer side of any trap or on any vent pipe. Trap vents in all cases (W.C.'s excepted) must be taken off discharge side of trap or waste pipe, as shown in diagram—crown venting will not be permitted. No wrought iron vents will be allowed below top of cellar floor, or to be buried under any earth.

This clause will prohibit the use of Richelieu closet bowls or any closet with a vent off in a similar manner above the floor. This clause is of great importance, as many of the local sanitarians

(Continued on page 26.)

Advance Programme for National Convention

To be Held in Montreal June 9 to 12—Special Attention Has Been Given to Question of Entertainment of Delegates and an Excellent Program Provided—Local Society Assisted by Manufacturers and Supply Houses.

Montreal, Que.—The program for the annual convention of the Canadian Society of Domestic Sanitary and Heating Engineers, which will be held in this city, June 9 to 12, in so far as it has been definitely decided upon at this early date, is given below. Every effort is being put forth by the entertainment committee to provide a right royal welcome to the delegates who will attend this convention from all parts of the Dominion. To that end a theatre party, bowling match, motor tour of the city, trip to the harbor and a banquet have all been arranged for, so that from the standpoint of entertainment the committee have done their work thoroughly.

Programmes of various discussions have not yet been announced, but the executive committee promise a programme which will prove very highly beneficial to all who are sufficiently interested to attend.

Following is a skeleton outline of programme:

June 9, 8.00 p.m. Executive committee will meet at Freeman's Hotel to make final arrangements.

June 10. Official opening of convention at 9.30 a.m. Afternoon session at 2.00. Theatre in the evening.

June 11. Sessions at 9 a.m. and 2 p.m. In the afternoon a trip will be taken through Montreal harbor and the floating dock inspected. Bowling match in the evening.

June 12. Regular session at 9.00 a.m. Conference with manufacturers and supply houses at 2.00 p.m., after which a tour of the city will be made in electric cars. Convention will close with a banquet and evening in Dominion Park.

This program is, of course, subject to slight changes. The convention committee have a big treat in store for delegates in the matter of convention rooms, which they will spring in the form of a surprise.

Official headquarters will be at the Queen's and Freeman's Hotel, rates at which may be obtained on application to the secretary.

The Master Plumbers' Association of Montreal are being ably assisted in the preparations for the convention by the members of the following firms: Thos. Robertson Co.; Jas. Robertson Co.; Standard Ideal Co.; Standard Sanitary Manufacturing Co.; Steel Company of Canada; Mott Company; Twyford Company, Canadian Trenton Potteries; Jenkins Bros., Ltd.; Canadian Tube and Iron Co., Ltd.; and Fittings, Ltd.

Fuller announcement with regard to convention will be given in next issues.





The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

SECURING PORTABLE GAS BURNERS.

Editor of The Sanitary Engineer. — Would you kindly inform me where I can procure portable gas burners suitable for use in the Domestic School of Science. I have to replace some that have been broken. They are a small flat burner, swung from a bracket on to a table and are used to demonstrate cooking to students. The trustees have no record of where they were procured. If you would kindly furnish me with some firms who would be likely to have those in stock I would be greatly obliged. Charlottetown, P.E.I.

Henry.

Try Jas. Morrison Brass Mfg. Co., or Gurney Foundry Co., J. L. Morrison & Co., all of Toronto.—Editor.

A CONCRETE CHIMNEY.

Editor of The Sanitary Engineer. — Is a concrete chimney as staple as one made of brick? Will it endure as long, and does it cost more or less to put up first?—A. J. Dahl.

We are told by those who have had the experience that a concrete chimney is staple to an extent beyond all other kinds. Numerous instances are noted where some of them went through the earthquake in the Western States and were not at all harmed. Up to the present, as far as we can find, the concrete chimneys give evidence of lasting far longer than brick chimneys. We believe that the first cost is somewhat less, per foot, than the brick chimney.—D.C.H.

DIFFERENT OPINIONS AS TO HOUSE HEATING.

Editor of The Sanitary Engineer.— I have a customer who is going to put up a one-storey frame dwelling this season and desires to heat it by steam, hot water or vacuum. Now he has been writing around and some one told him the hot water heat was no good and got him all scared, as they told him it might freeze and burst. The mercury will be at 40 and he does not

know what to do as he likes hot water heat best. Will you please tell me some points. I enclose the plans for your help.—Z.Z.

These plans, shown by Figs. 1 and 2 would seem to give one the chance to use either hot water or steam heat. We fail to see where hot water heat would

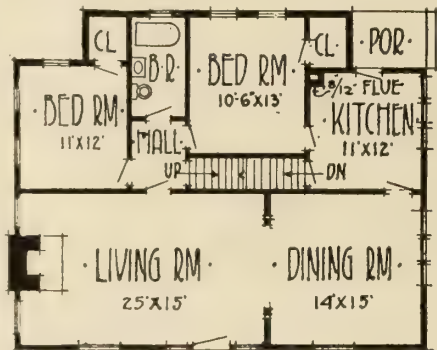


Fig. 1.

fall down. We know many places where the mercury goes lower even than 40, where hot water heat has been a great success, for example in stores, dwellings and hospitals. The water in the system will keep hot for several hours and we do not think that the job would

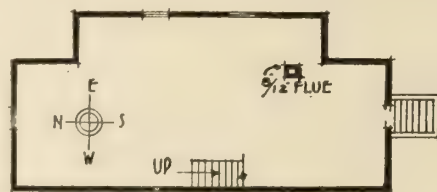


Fig. 2.

freeze. A radiator that was cut off might, but in such weather we venture to assert that all the radiators would be on duty. A first class hot water job ought to heat this dwelling all right.—D.C.H.

TIGHT JOB ON GASOLINE PLANT.

Editor of The Sanitary Engineer. — I have been asked to do some piping for a gasoline plant. Can you let me know which is the best, paint, oil, or a mixture to use on the joints so as to ensure a tight, reliable fit? also what kind

of pipe is best, black iron or galvanized?—F.R.R.

In making joints on iron pipe, care must first be taken to see that all oil is cleaned off the threads of both pipes and fittings when used for gasoline plants or pipe lines. The fittings should be washed in gasoline as well as the threaded pipe, which should also be rinsed out with gasoline. Then a mixture of pure glycerine and litharge made to the consistency of stiff paint (only a small quantity to be mixed at once as it will set quickly) has been found best where a good reliable job is wanted. Mixture must be applied only on the threads of pipe and HOT in the fittings. Only galvanized pipe should be used.—D.C.H.

COST OF HEATING VS. ENTIRE HOUSE COST.

Editor of The Sanitary Engineer. — Will you be kind enough to tell me what percentage the cost of heating installation forms of the entire cost of building a house. Is it as much as 15 per cent.?—G. H. Fall.

It might be in some cases and in others not. The cost of building a house varies in different localities, also the cost differs with different types of houses that might require the same amount of radiation and same size of boiler. So it becomes plain that the percentage would vary. As a general thing, however, the heating percentages will run something as follows:—for steam from 8 to 10 per cent.; and for hot water anywhere from 10 to 15 per cent. for a first-class guaranteed job.—D.C.H.

SOLDER FOR JOINTS ON BLOCK TIN PIPE.

Editor of The Sanitary Engineer. — Could you inform me what kind of solder I can use to make bolt or blow pipe joints on block tin pipe? I have a lot to do shortly and find the ordinary solder to hard to melt, and even if dropped on the pipe will melt a hole in it.—T.L.J.

Make up a solder as described below, and run into very thin sticks. To make one pound or portion of a pound use these proportions:

- 10 oz. pure tin.
- 5 oz. pure lead (tea lead for choice).
- 1 oz. bismuth.

Heat these only enough to melt, but do not allow to burn. The above solder can be used with blow pipe or copper bolt which does not require to be as hot as when using ordinary solder. Use Resin as flux.—D.C.H.

“INCIDENTAL EXPENSES.”

Editor of The Sanitary Engineer. — Have you any pointers on that annoying item in every heating or plumbing job, i.e., “incidental expenses?” If so, I would be glad of any suggestions. — G. L. Graves.

We believe that if you read the columns of this paper for six or eight months that you will get many different ideas on this subject. On different jobs we have known the “incidental expenses” to go as low as \$3, while on other jobs it has simply gone out of sight. Wouldn't it be a good arrangement to make each dollar invested in the work bear its portion of the incidental expense? This would make it an easy and accurate matter to figure out what it should be for every job. — D.C.H.

WHAT DISTANCE DOES THE PUMP RAISE WATER?

Editor, of the Sanitary Engineer.— About how far will an ordinary pump raise water?

Helper.

Unless the suction pipe was quite straight, we should not put in the pump to raise the water much more than 25 ft. The actual distance is quoted at something more than the figure mentioned but it is well to stay on the safe side. Have as few crooks and turns as possible and take care in making up the joints that there are no leaks. In this way you should make a satisfactory job every time.—D. C. H.

HOW WATER ACTS ON PIPES.

Editor of The Sanitary Engineer.— Please tell me about the manner in which water acts on different pipes.— C. J. P.

The waters of different places have a solvent action on metals. Most waters corrode, to a greater or less extent, the pipes which they touch, forming what is called rust, or more strictly speaking red oxide of iron. Heat and pressure increase this action of the water. Con-

densation from a steam job where the pipe line is for a long distance, below the water line had better be returned through a cast iron pipe.—D. C. H.

BORING A HOLE THROUGH GLASS.

Editor of The Sanitary Engineer — I have a square of plate glass that is on my office desk. Now it slips around just enough to be annoying and if I could bore two or three holes in it so as to put some screws through, it would be a relief. No one can tell me how to



Fig. 3.

bore the holes and so I thought that I would write you and maybe you could tell me.—A.B.

After looking around for a practical manner in which to do this we found it and also publish illustrations, Figs. 3 and 4 showing part of the operation. Get a three-cornered file that is of the



Fig. 4

size that you want the hole to be in the glass. Grind the ends of the file to points as shown in Fig. 3. The plate glass must be placed on some level surface. Place a piece of cloth under the glass. In boring the hole keep it wet with a solution of camphor and spirits of turpentine.

HOW LONG DOES IT TAKE TO SET UP A HEATING BOILER?

Editor of The Sanitary Engineer.— Generally speaking, will you be kind enough to tell me the time it will take a steamfitter and one helper to set up an ordinary house heating steam boiler? F. C. Grant.

Making a rough guess at it we should say that there are about 100,000 different kinds of steam boilers (more or less) and every individual kind of boiler has some kink or other that is claimed to give it the advantage over anything else

on the market. There are upright boilers; horizontal boilers; screw nipple boilers; push nipple ones, and boilers that are packed. We have observed boilers that two men could set up ready for the piping in less than an hour's time. On the other hand, we have seen men work like the deuce for all day and when night came the boiler was not set up complete. It depends upon the type of the boiler, the conveniences at hand and the honesty of the fitter—principally upon the last, we believe. So you can pay your money and take your choice.—D. C. H.

SLOP HOPPER MINUS TRAP.

Editor of The Sanitary Engineer.— Could one put in a slop hopper and not put in a trap with it and be sure that no gas would get through the hopper? Z. X.

On some kinds of hoppers one might if the back pressure on the sewer was not very great. However, to be perfectly safe, we are inclined to believe that we should use the trap, especially if the hopper were near the kitchen or in the building.—D. C. H.

WHY WORKMEN GET TIRED OUT.

Editor of The Sanitary Engineer.— How many measurements should a good steamfitter or a plumber be able to take and then go to the bench, cut them out and have everything line up all right? A Helper.

If the job is in such shape that the workman can get at it readily to make the measurements he should be able to take at least six at a time and have them come out all right. In some cases he might be able to measure up nearly the whole job at the first shot. It all depends upon circumstances. There is no rule by which such matters can be set for each job is a proposition by itself and presents its own problems to be solved by the common sense and experience of the workman. Inability to take more than one or two measurements at a time begets much foot work on the workman's part and, as night comes on he is tired, not from real work; but from running to and fro and worrying about the whole blamed shooting match. We should advise you to begin to get the habit of taking as many measurements as possible at one time. You will make some mistakes, at first, but “they all do it” and, as time passes, you will make fewer and fewer mistakes; and more speed, and, after a while, you will have reduced the walking act about three-quarters on every job that you have to do, thus saving time, worry and useless work and making yourself more efficient.—D.C.H.

Smokeless Boilers in Salt Lake City

Study of Fuels and Combustion Shows Amount of Actual Heat Lost in Form of Smoke—Introducing Smokeless Types of Furnaces Brings Economy and Saving of Fuel—Proposed Legislation to Avoid Smoke Nuisance.

Written by Jesse Coogan, C.E., in the Salt Lake Desert Evening News.

During the past three years I have made an especial study of fuels and combustion, as they are a most important adjunct of my profession and business as a heating engineer, designer and contractor for large heating and power plant equipments. Although I have had twenty-four years' practical and technical experience, it was only three years ago that I entered seriously into the question at issue, viz., fuels and combustion.

Education and "scientific firing" will not cure the smoke nuisance in Salt Lake City, since it is impossible to legislate brains, intelligence and energy into the man behind the shovel that feeds 95 per cent. of the heating and power boilers of this city, if the equipment he handles is not of a kind and arrangement by which he can secure smokeless results and at the same time produce the work intended.

Any legislation that will cause an abatement of the smoke nuisance will cause owners a gain and a profit, inasmuch as smoke issuing from a chimney represents just so much waste, being nothing more than minute particles of pure carbon carried off from the fire in gases that are insufficiently heated to burn.

The quantity of heat given to a boiler is determined by the final state of the gas escaping to the chimney stack. If nearly perfect combustion has taken place in the furnace of a boiler we are able to obtain an efficiency of as high as 75 per cent., by which is meant that 75 per cent. of the actual heat in the fuel is transmitted into work, as represented by the heat generated by the boiler for heating or power purposes. The other 25 per cent. is a loss that cannot be avoided, as it represents loss resulting from radiation, due to boiler construction and gases escaping into the stack, which are necessary to cause draft, etc.

Whenever dense smoke issues from a stack we can safely say it represents 75 per cent. of the actual heat in the fuel that causes this smoke and the gases carried with it; therefore Mr. Owner is losing just 50 per cent., or one-half of what he could save if his furnace was of a type that turns this smoke and escaping gases into useful work by burning them at a high temperature and converting them into useful work. Therefore any legislation compelling the use of

furnaces that will not cause smoke, will result in direct economy and a consequent saving in fuel to the owner.

It is, therefore, for this reason that in cities that have compelled absolute obedience to smoke laws and ordinances, owners have learned the great economy of using smokeless types of furnaces and are satisfied with them after it has been driven into their hands by practical experience. They now know that instead of being a hardship the compliance with anti-smoke laws is a benefit, inasmuch as it invariably results in a saving of fuel as well as a much higher efficiency from boilers.

This being an established and easily proved fact the average human will ask why the owners of these boilers do not voluntarily make such changes as will result in this saving and consequent abatement of the evil that makes Salt Lake City one of the meanest and dirtiest cities in the United States in which to live during the five months of an average season.

My only answer is: ignorance, greed and stinginess. Most owners consider the cost of heating and power as a necessary evil and take for granted that they must burn up a certain amount of coal per season anyway; therefore, what is the use of going to the expense of changing furnaces. That his neighbor and the public at large are inconvenienced or injured in health and pocket-book does not appeal to him until such time as laws are made and enforced that will make it much cheaper for him to obey these laws than not to obey them.

Before suggesting effective legislative remedies to stop this smoke nuisance, I wish to say that any statement or idea that the smoke nuisance is not "really unhealthy" is most erroneous and vicious. The smoke and carbon monoxide (unburned gases) that issue from most stacks in this city will not cause death to those inhaling same. But the indirect evils consist of the fact that this carbon monoxide when inhaled is one of the worst known irritants to the mucous membranes of the throat, nose, eyes, and ears. Any citizen of Salt Lake City that will take the trouble to make observations will find that he feels much better and coughs less and expectorates less when a good wind sweeps the city clear of smoke than when the usual heavy pall of smoke and carbonic gas

settles down on the city, due to lack of sufficient wind to lift it or blow it away from the city. A good majority of grown persons are more or less afflicted with some form of catarrhal trouble and I notice from personal experience that mine is aggravated very much during my stay in Salt Lake. Everybody subjected to this smoke nuisance must frequently notice the dark and black color of throat secretions in the winter time. This is nothing more or less than the minute particles of carbon emitted from smoke stacks, which have been inhaled in home or office, or on the street, together with the more deadly and invisible carbonic gas that passes from these stacks as a result of imperfect combustion of fuel in the furnaces of boilers.

It takes me much longer to recover from a cold in Salt Lake than in any other city I have ever visited. I personally seem to catch one cold after another and attribute this condition to the fact that my nose and throat are constantly irritated by smoke and gas and thereby rendered susceptible to change in weather. Inquiry from many people leads me to the belief that the same trouble is experienced by many who have lived here for years and are acclimated to the ordinary changes of weather. So much for the sanitary end of the complaints against the smoke nuisance.

A time-worn excuse for not installing smokeless boilers is the claim that there are no satisfactory ones on the market. This is a poor and false excuse, as there are several on the market at the present time, and the prices are most reasonable when the benefits are considered.

Many manufacturers of steel heating boilers have placed on the market in recent years various types of smokeless boilers so that the question of price or availability should not be considered a legitimate excuse.

There is no excuse except ignorance and greed, for not using some typical smokeless furnace on all large heating and power boilers in Salt Lake.

As an evasion, the owners of moderate sized heating plants will claim the mechanically operated stokers and smokeless furnaces are expensive to operate and require experienced help. For their benefit I will say that there are quite a number of different makes and kinds of boilers for heating pur-

poses that have smokeless furnaces and are now in use in Salt Lake. I recently installed three hand fired smokeless boilers of the down-draft type for the Granite School district, and they have been found to not only be smokeless but for more economical than any type of hand fired boilers in use in Salt Lake or elsewhere where bituminous coal only is available.

Various cities have smoke laws and most of them are effective. All thinking sensible men will agree with me that "scientific" or "intelligent" firing by hand cannot be depended upon and, therefore, other measures must be adopted to secure the desired results. As the question is a large one and concerns many owners of boilers, the solution cannot be arrived at in one day, nor in any season, and hence I believe my suggestion as to the solution of this problem will not only be effective but very reasonable.

I suggest that a law be passed by the present legislature empowering the city to create a commission on smoke abatement and have the members thereof appointed by the mayor, this commission to consist of not less than five members, two of whom shall be practical and experienced engineers and one a technical man of high standing. The other two members may be laymen if so desired. Then provide that any and all new boilers with more than 75 square feet of heating surface capacity must be of a type and size approved by the commission before installation. This will exclude 90 per cent of the house heating boilers so that these will be outside the jurisdiction of the commission. Let the above rule go into effect at once and provide that no building permit will be granted by the city without the O.K. of the commission on the boiler equipment.

Let the law provide that on and after January 1, 1915, any and all boilers in use in Salt Lake City or within one mile of its city limits, must be inspected and approved and the owners furnished with a certificate of approval; without which certificate the commission will have authority to close down and seal up said boilers until proper arrangements are made to comply with the law. This section of the law will cause owners of present boilers to arrange to comply with the law within the next two years. Provide a heavy penalty as follows: For failure to comply with the law, make the owner or the tenant or both responsible parties and not the fireman or janitor. Provide for the first offense a fine of \$25, for the second \$50, and keep doubling up until Mr. Owner will provide proper furnaces and competent attendants.

Some will say that this section of the law is too severe, as it will compel the hiring of more expensive help to fire boilers. Most of the present tenders of heating boilers are laborers pure and simple and so underpaid and overworked that it will be a mercy if owners are forced to hire more intelligent help or reduce the work and hours of present furnace tenders.

Also let the law provide that no stack or chimney shall emit dense smoke for a longer period than a total of five minutes in any one hour of the day or night. This will permit of cleaning of fires once each hour at which time some smoke may be necessary, although fires as a general rule are not cleaned more than two or three times per day.

Next I will allow any citizen to make a complaint against the owner or user of any smoke stack or chimney that emits dense smoke for more than a total of five minutes in any one hour. Make each case a jury case and if any kind of competent and reliable testimony is presented, you can take it for granted that Mr. Owner will generally and quickly be found guilty. The doubling up of fines is in use in Leeds and other English cities, and has resulted in almost a complete abatement of the smoke nuisance in those cities where the poorest kind of coal is in use.

The chief commissioner should receive a large salary and his requirements for office should be a complete, practical and technical knowledge of heat and heating as well as of fuel and combustion, so that complete confidence could be placed in the correctness of the rulings and in the judgment of the commission. The commission should be provided with a secretary whose duty it will be to respond to calls of citizens regarding complaints. The secretary will be provided with a camera and take photos of stacks every half minute when smoking and be prepared to swear to the correctness of the photos and the time of taking, etc.

This method is used in Milwaukee, and has resulted in one of the cleanest factory cities in the world.

Another great good accomplished by this commission would be the elimination of a lot of worthless devices that are pawned off on owners as "smoke consumers," "smoke preventers," etc., most of which wind up in the junk pile after only a short usage has proven them to be of no value whatever.

Practical and experienced stationary engineers would welcome a law of this kind, as it would compel a greedy owner to replace defective or deficient boiler equipments which are notoriously unable to operate without smoking badly, no matter how much brain and brawn

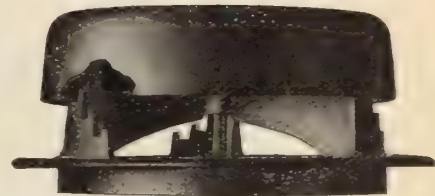
is furnished by Mr. Engineer or the fireman under his control.

Other details and duties of the commission could be worked out, but in the main, the above will answer the purpose of positively cleaning the otherwise beautiful city of Salt Lake of a nuisance and a shame that would not be tolerated in any other civilized city in the world. I do not believe a single taxpayer or citizen possessed of civic pride would or could object to the comparatively small expense that would be entailed in the adoption of this, the only positive remedy of a situation that is fast becoming unbearable to the pride and the health of the citizens of Salt Lake City.

New Plumbing Goods

IMPROVED MUSHROOM VENT CAP.

Geo. E. Knowles, New York, is now offering to the trade his improved mushroom vent cap, known as the "notch type." This type allows of being set at any opening, and there locked by means of a screw lock, thus preventing being tampered with. The ventilator



is used in connection with indirect or mechanical system of heating and ventilating theatres, schools, and all large auditoriums, and is claimed to insure perfect ventilation through uniform distribution, accurately regulating inflow or warm or cold air. Four sizes—namely, 4, 5, 6 and 8-inch, are standard, but same type ventilator can be had in any size to suit conditions, and finished in any color desired. Manufacturers claim this to be the lightest, simplest and most efficient device of its kind on the market.

Winnipeg, Man.—Mr. Price, heating engineer, late of Toronto, has joined the forces of Bearisto Plumbing Co., and will have control of the heating end of the business.

Regina, Sask.—Pitts Bros., plumbers, who formerly had their shop at the corner of Broad Street and Eleventh Ave., have moved to new quarters on Osler Street between Eleventh and Twelfth Avenues.

Unsanitary Conditions in Capital City

Sanitation Campaign Reveals Many Interesting Facts—Plenty of Work Ahead
For the Sanitarian—Necessity of Thorough Investigation in Other Cities
Pointed Out as Result of Conditions Found in Ottawa.

Ottawa, Ont.—A campaign has been entered into very enthusiastically by the civic health department, the anti-tuberculosis association, city council and daily newspapers, as well as many private individuals of Ottawa to promote more sanitary conditions in this city. Facts of various kinds have been gathered together, all pointing out the necessity of the general public waking up to the dangerous and unsanitary conditions which surround them.

Dealing with the question of water supply, which owing to rapid commercial growth of the city has been inadequate, the waterworks committee have favored the sinking of nine shallow wells with casings to exclude all surface water, and ranging in depth from 100 to 500 feet., from which to secure the city's water. Deep wells were at first proposed, but on these estimates ran to \$30,000, just twice the present appropriation, so that these were ruled out of the question. Operations will commence at once on the shallow wells, and until these are ready for operation the city will continue to derive its water from the Ottawa Dairy.

When brought down to a fine point the question should not be one of expense, but of purity of water supply. Mr. Race, bacteriologist, claims that 50 per cent. of wells of this depth are found to yield impure water. The question then is "Is Ottawa going to be in any better condition after this expense than before it?"

Further, the health department has ordered the closing of all outside privy vaults on streets where there are sewers. In Ottawa there are about 1,650 privies, of which 325 are on streets where there are sewers and which therefore have been ordered to be closed. This is undoubtedly a move in the direction of proper sanitation, but circumstances in the districts where these privies abound are in most cases such as almost to prevent the immediate enforcement of the law. The time limit set was ten days and has now expired with only a few cases remedied. Here evidently is no scarcity of work for the master plumber.

Dealing further with unsanitary conditions, the anti-tuberculosis association has been revealing many undreamed of conditions. Their report recently issued to the general public states briefly in part:

"What is the use of building hospitals and refuges and dispensaries for

the relief of misery if we stupidly allow these breeding places of disease and vice to continue, or legalize things which make them possible.

"Add to these visible conditions an uncertain water supply, doubtful plumbing, and in some places no sewage system worth the name. We simply wage an unequal contest trying to eradicate disease by curative methods while these sources of contagion are left to pour out their floods of pollution.

"We have an efficient board of health and all the organization needed, but it will all go for nothing if the medical health officer and his helpers have their hands tied by insufficient appropriations, or if back stairs influences are allowed to thwart their good intentions.

"More than all, what is needed is that our citizens co-operate by arousing public interest in these matters, and insist upon their being settled in accordance with proper human standards of living."

All these questions fall more or less within the field of the sanitary engineer. Though purity and impurity of water from some standpoints concern him little, still from the standpoint of tightness of mains and branch lines, or water conduction, are of vast importance. Sanitary conditions with regard to privies, plumbing, sewage systems, and disposal of house sewage are all directly in line with his profession. He is the practical and scientific man on the job who deals with the prevention of disease by removing unsanitary conditions, not in a theoretical way but in a practical systematic manner.

Ottawa is only one of many cities where an educational campaign set on foot by the sanitary engineering profession should be entered into. The calling of the sanitary engineer reaches far beyond the mere question of making a good joint. It deals with the health of the nation, the municipality and the individual. Careful inspection of the system in your own city will be an education to you in more ways than one. What are you going to do towards advancing the standard now only too common throughout the Dominion?

LINSEED OIL VS. LARD OIL.

Editor of The Sanitary Engineer. — I have been a subscriber to your valuable journal for a number of years, and during that time I have worked in all

climates. In your issue of Feb. 15 someone asks for a method of keeping lard oil in working order. I would say don't use it at all, but use linseed oil for all climates.

Thomas M. Leary,
Hamilton, Bermuda.

TRADE NOTES.

Salmon, B.C.—S. T. Dutson, sanitary and heating engineer, Kamloops, B.C., is about to open up a branch shop in this city.

St. John's, Que.—J. B. Plouffe and L. Plouffe, of the firm of Plouffe and Frere, sanitary and heating engineers, have registered.

Merritton, Ont.—The Canadian Carbide Co. on April 24 suffered loss by fire to the extent of \$10,000. Damage is chiefly to electric machinery, and is well covered by insurance.

Galt, Ont.—Frank Short, who for the past six years has been in partnership with I. J. Ross in the plumbing, heating and electrical business, has started into business for himself in this city.

Medicine Hat, Sask.—Walter G. Armstrong, formerly superintendent of the plumbing department of Thompson & Homer, Saskatoon, has started into the plumbing and heating business here with George Lynch.

Saskatoon, Sask.—Percy Atkinson, who for some time past has been connected with Thompson & Homer, sanitary engineers of this city, has joined the staff of the Knechtel Co. and will act as superintendent of the plumbing department.

Word has just been received by The Sanitary Engineer from J. E. Farrell, of North Bay, who, with his wife, is enjoying a trip through the sunny south. Already they have visited Washington, the battle field of Gettysburg, and Norfolk, and intend to go on to New York by boat, and from there home to North Bay.

Winnipeg, Man.—The name of the Winnipeg branch of the "Pease" Foundry Co., Ltd., has been changed to "Pease" Western Foundry, Ltd., and is located at the old address, 287 Donald St., Winnipeg. J. M. Bell, who for many years acted as sales manager at the head office, Toronto, and who was moved to this city some two years ago, is in charge of the Winnipeg branch and will have under his care all business in the territory from the Twin Cities to the Rockies.

Jolts for Journeymen---By "Phoenix"

A REFLEX-ACTIONED JOKE.

To one who has had experience in the installation of the modern bath rooms; or to any old kind of an inspector who has made the rounds of different buildings in any city of considerable size; or to house hunters this picture we publish from one of the humorous papers of the day will have a meaning far from "funny."

It was, doubtless, taken as a joke by the perpetrator, but it is one of those kind of jokes that has a kick in it that was little expected, methinks.

This "Fountain of Youth" business has far more truth in it than poetry, the reality beats the visions of other days by more than a mile. In Canada and the United States there are, without much doubt, several millions of unwashed citizens, both young and old. Worse than that, many of these citizens could never take a decent bath, or a bath decently, just as you choose; if they had the desire, which, sad to say, plenty of them never experience.

Sanitary engineering represents the cleanest, or rather it might be more proper to say, the greatest cleaning business on the face of the earth. Few in the craft realize this and so they are not, many times, found hand and glove with the movements that tend toward improvements for the betterment of mankind—but only as it points toward their own pocket books. To spend any time or money for educational purposes along lines that would lead up to great civic improvements seems to some plumbers (excuse me I mean to say "sanitarians") like throwing the cash away. They either will not, or don't do so themselves and, like the fabled dog in the manger, they don't want any one else to do so either. One very evident lesson that this picture should teach sanitarians, then, is OPPORTUNITY. Opportunity is bald, behind, you know; therefore grab her by the forelock before it is too late.

It is a mistaken idea that all bad plumbing is found in the dwellings of the tenement" districts, or in the homes of the poor. Please get "shet" of that idea instantler, for many a house with an imposing front located on some swell boulevard has in it some of the rottenest plumbing ever. To prove this statement one has but to go house hunting in some large city during that period that

comes just before the "spring moving" time.

If you don't see some sights that will make you sick why you can take my hat.

Therefore, there exists the biggest kind of a field to be imagined for the sanitarian, i.e., educating the people to take baths; and again, to secure the proper facilities for securing these baths, and all that goes with them. By that I mean, of course, the remaining fixtures that belong to a good plumbing job.

should be taken to remove it. It can not be done instantly, but a campaign can be started that will gradually bring about beneficial results. Such thoughts and actions would be an eye opener for the future sanitarians and it is to them that we must look, that the business does not go backward. Ever stop and think, for a moment, Mr. Present-Day-Sanitarian, of what is going to happen when you drop out and go to pick up your harp (for I wouldn't dare to suggest that you'd be seeking a melting pot) in the kingdom beyond? You know that



The Fountain of Youth—as shown in "Life."

Wouldn't you think that, after a time, this craft of ours would wake up to the chances they are passing up each season and, for once, get real busy?

To a young man who is just learning either the trade or the business it seems to me that he can not do better than to observe just the features that are mentioned in this article and put in a good bit of his spare time in making a careful study of them.

There is a cause for all this and that cause is not poverty in all cases. Get after the direct cause and see what steps

there is somebody who has got to keep up this business after you have pegged out. Are you giving that party a fair deal to-day. If not, WHY?



TRADE NOTES.

Montreal, Que. — Chas. Petit and Raoul Archambault, of the firm of Petit and Archambault, sanitarians, Montreal, Que., have registered.

Montreal, Que.—The partners of the firm of E. J. Roch and Boyer, sanitarians of this city, have just registered.

Complete Course in Sheet Metal Work

By L. W. KOSER

On plate 28 we show in perspective and detail, two styles of ventilators used in connection with skylights.

Fig. 1 shows a double pitch skylight having two tubular ventilators, and Fig. 2 shows a hip skylight having a ridge ventilator. Either of these styles can be used on any ventilator having a ridge.

ventilator, the arrows show the way the air passes up and out. This construction is such that an upward draught or suction is created no matter how the outside currents of air come in contact with the ventilator.

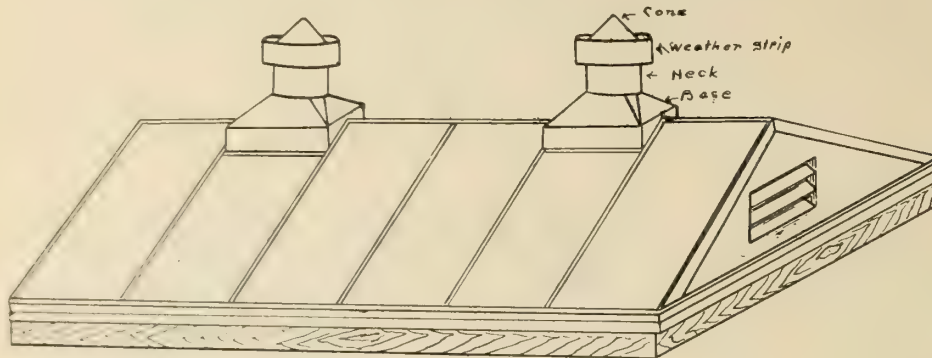
Fig. 4 shows how the different parts are fastened together, viz., by forming

The flares "C" are developed as frustums of a cone.

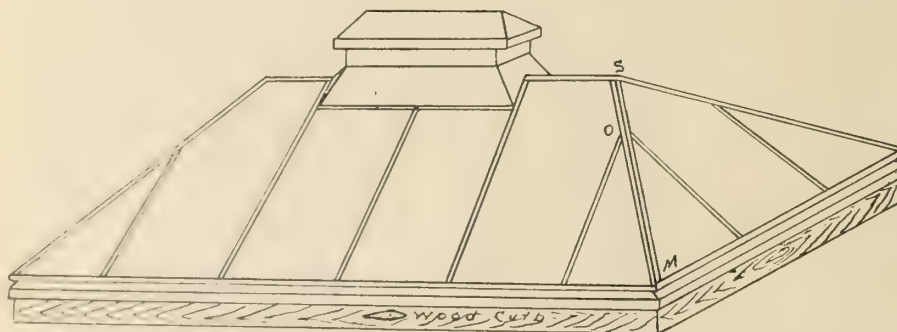
The cone top "B" is developed by the cone method.

Use 26 gauge iron on small ventilators of 12 in. diameter neck or less and 24 gauge in ventilators of 12 to 36 in. neck and heavier metal as the size increases.

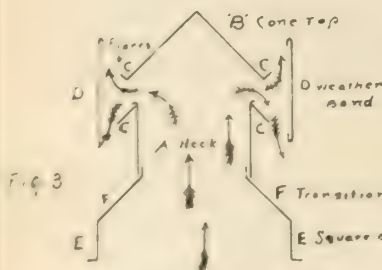
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DOUBLE-PITCH SKYLIGHT WITH TUBULAR VENTILATOR
FIG. 1



HIPPED SKYLIGHT WITH RIDGE VENT.
FIG. 2



Detail of Tubular Ventilator

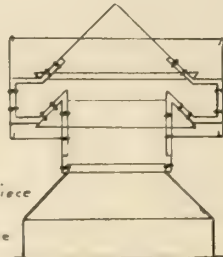
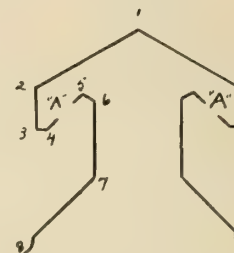
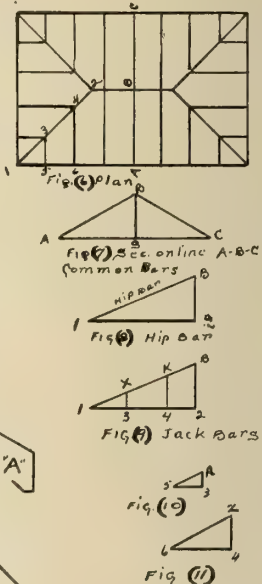


FIG. 4



Detail of Ridge Ventilator
FIG. 5



The student has learned sufficient in the previous lessons to enable him to develop this pattern for this ventilator, with the exception of one part, viz., the transition piece F which will be taken up in the lesson on triangulation.

Fig. 3 shows a detail of the tubular

strips of band iron to lay against each different part and rivetting or bolting it to the different parts.

First detail a ventilator as shown by Fig. 3 less the transition piece and base. The neck "A" and weather band "D" are simply straight pieces of pipe.

Fig. 5 shows a detail of the ridge ventilator.

The openings "A" are holes punched out for the passage of the air.

The ventilator does not necessarily have to be formed to this shape as the idea is merely to form an ornamental

shape in such a manner that the part where the holes are in shall be protected from the weather as much as possible.

To develop the pattern for this style of ventilator, lay off a half section as from points 1 to 8 and develop the mitres the same as for a square cornice mitre.

Detail and develop the pattern for a 6 in. tubular ventilator. And, for a ridge ventilator 18 in. long and 6 in. wide at neck. When these ventilators are made to fit skylights, the ends of the base are simply cut to the pitch of the light.

What we require to know now is how to find the length of the different bars.

As the hip skylight contains all of the different bars we will draw a plan of a hip skylight as shown by Fig. 6 in which A-B and C-B are common bars 1-2 the hip bar and 5-3 and 6-4 the jack bars.

We first draw a cross section Fig. 7 as follows:—

Let A-C equal the width of the curb on the glass line, S-B the elevation. Then A-B or C-B is the length of the common bars.

To get the hip bar draw the line 1-2 of Fig. 8 equal to 1-2 of the plan Fig. 6 erect the perpendicular 2-B equal to S-B of Fig. 7. Then 1-B equals the length of the hip bar.

To get the jack bars draw at Fig. 9 a diagram the same as Fig. 8 set off on the line 1-2 the distance from 1-3 and from 3 to 4 of the plan.

Erect perpendiculars from 3 and 4 until they touch the line 1-B, then 3-X and 4-K represent the height of the jack bars at points 3 and 4 of the plan.

Now draw the line 5-3 of Fig. 10 making it equal to 5-3 of the plan. Erect the perpendiculars 3-R equal to 3-X of Fig. 9. Then R-5 is the true length of the jack bar 5-3.

In a like manner draw the line 6-4 of Fig. 11, making it equal to 6-4 of the plan. Direct the line 4-Z making it equal to 4-K of Fig. 9. Then Z-6 equals the length of the jack bar 4-6.

In Lesson 8 we take up "Triangulation," which is the name given to that part of pattern drafting in which the pattern is developed by means of triangles.

This method is only used for developing irregular or uneven surfaces where the parallel line method (such as is used for cornice mitres, etc.) cannot be used, or the radiating line method (such as is used for cones, etc.) cannot be used. The surface is divided off into triangles. Hence the name, "Triangulation."

The method is based largely upon problem No. 57, Plate 3, Lesson 1, which is to construct a triangle from given measurements.

The student should know by now the

meaning of the words plan and elevation. However, we will refresh his memory by stating that a plan means a drawing of an object on a plane or flat surface. For instance, a plan is a bird's eye view of the object or it is the way it would look to you if you were directly above it looking down.

Take for instance a plan of the rafters of a roof would be the same as if you were up in a balloon looking down in a building just after the rafters were set in place and before the roof boards were on. You would be able to see where each rafter was placed but you could not tell how long the rafters were or how steep the roof was, as it would look flat to you. This would be a "plan."

To see how steep the roof was it would be necessary for you to lower your balloon until you were directly opposite the roof and the same distance from the ground. This view would be the "elevation" and would give you the height of the roof or the centre. Then measuring from the highest point to the bottom of the rafter would of course give you the length of the rafter.

From this you see it is necessary to have a plan and elevation before you can get the length of the different rafters.

To explain let us suppose that A-B, Fig. 6, represents the length of the rafter of a roof as seen in a plan view.

B-C represents the elevation or height, then a line drawn from C to A gives the true length.

TRIP TO GALT AND PRESTON PROPOSED.

The subject of the annual picnic has once more come up before the Toronto Society of D. S. and H. E. This year a picnic excursion to Galt and Preston has been proposed. The following committee have been appointed to make all arrangements: T. B. Smythe, chairman, Dan Glynn, J. E. Fullerton, N. Blumberg, Fred. Gentle, and E. T. Needham.

Uniform Price on Six-Roomed House.

At the last meeting of the Toronto locals, discussion also arose with regard to the amount of estimate which should be made on the plumbing and heating in the average six-roomed house. A definite price was arrived at which in future will hold for all association members in Toronto.

The re-sale price list which has been the subject of much discussion and labor during the past few months, is now in the hands of all Toronto members, and has been in force for some two weeks.

PLACING THE RADIATORS.

Editor of The Sanitary Engineer. — Supposing that one had a room in a house to heat that called for 60 feet in one radiator, or to divide it into two radiators of 30 feet each?—P.J.W.

It would depend upon the tastes of the owner, the amount of space available for setting the radiator or radiators and also the extra costs. If one figured to secure a saving of fuel only by dividing the radiation, the amount of money spent for extra setting would be more than a sum invested for superfine air valves which would control the one radiator so that its heating would have the same effect as only one 30-foot radiator. If there is no spot that would accommodate the 60-foot radiator, why of course divide the radiation. Better consult with the man who has got to use the job and settle the matter beforehand to avoid any misunderstandings.—D.C.H.

NOISY TANK CLOSET.

Editor of The Sanitary Engineer. — I have tried several times to get the right fix on a certain closet tank but do not seem to succeed. It still makes a rattling noise as the water comes in every time that it is flushed. I thought that you could, perhaps, tell me the reason.—C.B.

We should think, from the statements you make, that there was too heavy a pressure, and if you put a pressure reducer on the supply pipe to the closet and reduced the pressure to about ten or fifteen pounds the difficulty would be overcome. In similar instances we have known the treatment suggested to be effective.—D.C.H.

THE KIND OF PIPE FOR A GAS JOB.

Editor of The Sanitary Engineer. — Please advise me if all black iron pipe is the best for a house gas job. I have put in several and some of the smaller pipes seem to develop many small leaks.—60.

Any pipe under three-quarters of an inch in size should be run galvanized iron. The same size rule applies to the fittings also. It will cost a trifle more at the start: but this will be more than compensated for by the saving in the number of leaks, the time spent in locating them and making them "good." Some gas fitters run inch pipe and all sizes under of galvanized iron and claim that it is cheaper in the long run for the reasons stated.—D.C.H.

Plumbing and Heating Markets

TORONTO.

Toronto, April 15.—Markets continue in about same position as at time of last report except that greater firmness prevails in all metal markets and some lines have shown advance. Heavy business is being done, especially in enamelware and soil pipe and prospects bid fair for an advance on latter before season is over.

Money situation continues tight and some jobbing houses are making a bigger effort than ever to collect in old accounts. One house during past month collected \$6,000 more than they sold, which fact shows clearly the way in which they are getting after collections. Stringency is generally thought to be easing off a little, but in some sections conditions are still pretty bad.

Enamelware.—No further revision of prices has been made since last writing. Demand keeps exceedingly heavy, causing factories to work at full blast. Market holds firm, and any changes will doubtless be upward again.

Iron Pipe and Fittings.—No further change has been made since advance announced in pipe last issue. Prevailing prices on black pipe now are: $\frac{1}{4}$ and $\frac{3}{8}$ in. \$2.28; $\frac{1}{2}$ in. \$2.72; $\frac{3}{4}$ in. \$3.28; 1 in. \$4.85; $1\frac{1}{4}$ in. \$6.56; $1\frac{1}{2}$ in. \$7.84, and 2 in. \$10.55. Galvanized is quoted at $\frac{1}{4}$ and $\frac{3}{8}$ in. \$3.18; $\frac{1}{2}$ in. \$3.57; $\frac{3}{4}$ in. \$4.23; 1 in. \$6.55; $1\frac{1}{4}$ in. \$8.86; $1\frac{1}{2}$ in. \$10.59, and 2 in. \$14.25.

Fittings are still quoted at prices given last issue as follows: Cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bushings, 65 per cent. off; malleable iron bushings, 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—Scarcity is beginning to be felt in some sizes, especially 6-inch medium. Through heavy ordering early in the year jobbers laid in a large stock, and by forcing manufacturers to turn out more goods, have so far avoided scarcity in all lines. Whether they will be able to get right through the season or not is doubtful, but so far prospects are pretty bright. Market is still very firm, and an advance before end of season would not be surprising. Discounts are: Medium and heavy, 60 and 5 per cent.; 7 and 8-inch sizes, 45 per cent.

Lead Pipe.—No further advance has been made since last writing, but market continues to hold firm, owing to primary markets advancing. Discount on lead pipe is 15 per cent., and on traps and bends 40 per cent.

Solder.—Quotations here vary. Some firms quote easy wiping 26, star 28, and

half and half 30. Others quote strictly half and half at 28 $\frac{1}{2}$, and still others at 28 $\frac{3}{4}$ to 31 cents per lb.

With tin and lead both advancing not only on primary, but also local markets, prospects bid fair for an early advance in solder. At present very marked firmness prevails.

Babbitt metal continues firm at from 6 to 60 cents per lb., according to quality.

Boilers and Radiators.—No change has been made here. Boilers are still quoted at 45 per cent. off, and radiators at, standard 44 per cent., and wall 40 per cent. off list prices. Demand for both these is quite heavy for season. Scarcity from a manufacturer's point of view continues in some sizes radiators.

Metals.—Since last writing two advances have been made on each of tin and lead, tin advancing first $\frac{3}{4}$ and later $\frac{1}{2}$ cent per lb., and lead first 25 cents and later 15 cents per 100 lbs. Thus present prices read: Tin 54 $\frac{1}{2}$ to 55 $\frac{1}{4}$ c per lb., and lead \$5.10 to \$5.50 per 100 lbs. Both markets continue quite firm at higher levels. Caulking lead continues to sell at 6 $\frac{1}{2}$ cents or on orders of 200 lbs. or over at 6 cents. Copper market holds firm at former level, prices ranging from \$16.10 to \$16.35 per 100 lbs. Whole market is firm and during past two weeks has taken on much greater activity.



KIND OF GASKET TO USE.

Editor of The Sanitary Engineer.—In order to secure a perfectly tight job that will last it is better to use rubber, leather or lead to make the union tight with a gasket? "Gaskets."

Under general circumstances we should say to use lead. If Mr. "Gaskets" is a steady reader of this paper he will discover that there are unions made that do not require any gaskets at all and that this class of unions have been on the market for some time. By using such unions one would do away with all gaskets what-so-ever.—D. C. H.



ORDINARY OR ECCENTRIC BUSHING FOR RADIATOR.

Editor of The Sanitary Engineer.—If I want to bush down the opening of a radiator from two to one inch will it work all right? Will it be apt to hammer or gurgle any?—Q.D.

In reducing the size so abruptly we should advise you to make use of an eccentric bushing. Otherwise there would be an unpleasant gurgling sound

when the radiator was heating up. It would work the other way, minus the noise.—D.C.H.



HOW PLUMBING BY-LAW WILL AFFECT TRADE.

(Continued from page 16.)

have dozens of such bowls in stock, and will be rendered unable to use them.

Self-closing Stop Cocks Compulsory.

Clause 63—No arrangement shall be made for supplying water closets or urinals except by self-closing cocks, unless when water is supplied by meter; and no arrangement shall be made for cleaning water closets or privy vaults by waste pipes from wash basins or sinks or other improper means; but they shall be fitted up with the proper fixtures and appurtenances belonging to them respectively. No copper lining of tank for a water closet shall be lighter than 10 ounces to the square foot, and weight must be stamped on lining in conspicuous and accessible position. Sheet galvanized iron shall not be allowed.

The intention of this clause is not to prohibit the use of automatic tanks, which may continue to be used, but to stop the use of ordinary stop cocks, which could be left running continuously, and thus waste the city water.

Further Changes to be Made.

There are undoubtedly several more minor details which will need to be ruled upon a second time by the Council. The by-law as framed was prepared for the introduction of iron pipe to the exclusion of soil pipe, but the Council, as stated in previous issues, did not consider it necessary to make this change. Hence, there are still a few changes of minor importance which will still be necessary.



SIX MISTAKES.

To look for perfection in our own actions.

Not to make allowances for the weakness of others.

To try and measure the enjoyment of others by our own.

To live as if the moment, the time, the day were unimportant.

To consider anything impossible that we cannot ourselves perform.

To attempt to set up our own standard of right and wrong and expect everybody to conform to it.



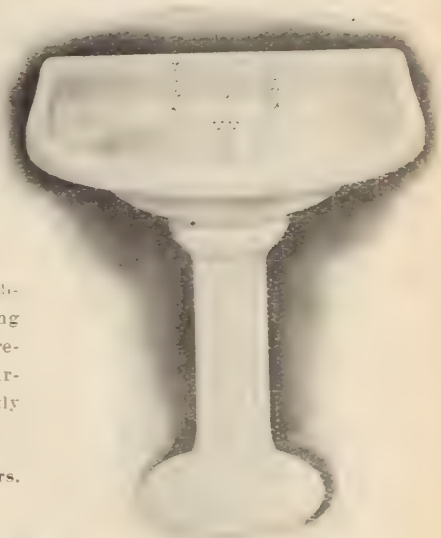
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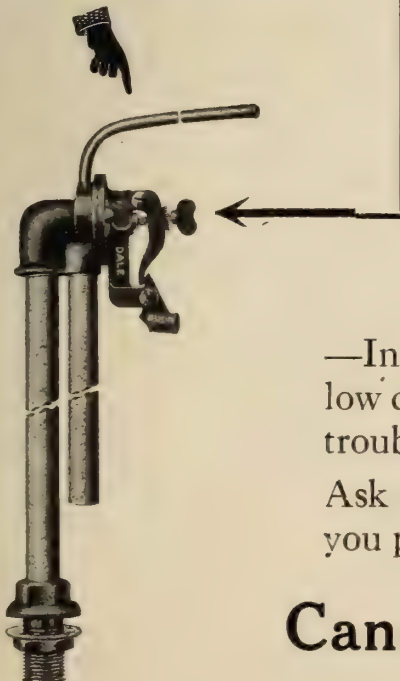
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FOR SALE—BUSINESS OR HALF INTEREST in plumbing and heating company in growing western Ontario city. Splendid opportunity for a live man. Details on application. Apply Box 772, Plumber & Steamfitter, Toronto, Ontario. (8)

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FOR SALE—PLUMBING AND HEATING business in one of the best towns in western Ontario. Good reasons for selling. Apply to Box 788 Plumber & Steamfitter, Toronto, Ont. (11)

PARTNER WANTED

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WANTED—ESTABLISHED PLUMBING AND heating business in thriving western town wants a first-class sheet metal worker who can handle ventilation and sheet metal work in general. Must have \$1,500.00 to invest. Apply Box 799, Sanitary Engineer, Plumber & Steamfitter of Canada, Toronto. (13)

SITUATION WANTED

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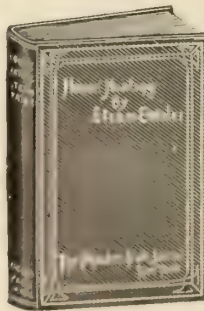
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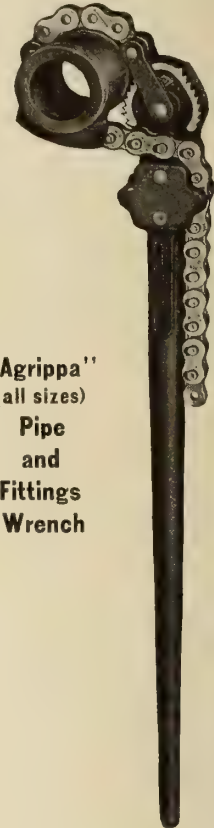
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New Editor Appointed for Sanitary Engineer

**Edwin Newsome to Assume Charge June 1st—Has Had Many Years of Practical Experience—
A Man of Advanced But Sound Ideas on Sanitation—Knows Plumbing Goods From the Ingot to
the Cardboard Box.**

For some months past, we have been looking around for a good, practical man to take editorial charge of The Sanitary Engineer, Plumber and Steamfitter of Canada.

We realized that our paper should take an advanced stand in all matters pertaining to sanitary and heating engineering, and that the ideal editor would be a man of wide practical experience, of good education and, above all, of ideas.

To find a man of these qualifications was no easy task. However, we finally ran him to earth, and so we are able to announce that Edwin Newsome will become editor of The Sanitary Engineer, Plumber and Steamfitter of Canada on June 1.

Edwin Newsome, whose likeness appears on this page, was born in England, and has lived in Canada for the past nine years.

His earliest experience in the trade was at gas-fitting, to which he was apprenticed, at the age of fourteen years. A little later he became connected with his father's business—the soda water and soft drink trade. His natural mechanical bent found expression in the installation of machinery for that line of business.

Thus, in setting up pumps, condensers, filters and purifiers, he received his first lessons in sanitation. While engaged in this way, he acquired a lot of experience in fitting up and laying out piping of all kinds—such as pure block tin, brass, copper, glass lined iron and brass piping, lead pipe and block tin lined lead pipe.

Mr. Newsome also had experience in installing steam engines and boilers, and has put in several hydraulic hoists and elevators. He then spent a year in the pattern shops at Clydebank, Scotland, which place he left nine years ago to come to Canada.

Ottawa was Mr. Newsome's destination, and, for several years after his arrival he was employed by McKinley & Northwood, one of the leading firms in the Capital City.

He then entered into business on his own account, in Ottawa, and during the four years that he conducted this establishment, Mr. Newsome gained an enviable reputation for thorough, painstaking work. The customer of his has yet to be discovered in Ottawa who was dissatisfied with the work done by Mr. Newsome and his staff.

Probably no other city in Canada has had such a strenuous fight against typhoid as has Ottawa. It was

during the time that Mr. Newsome was engaged in business there that the typhoid plague was at its height. Being thoughtful and studious, he lost no opportunity of investigating conditions, with a view to evolving some improved methods of sewage and garbage disposal. The Ottawa newspapers recognized in Mr. Newsome an authority on this subject, and even within the past two or three weeks, his opinions have been quoted with approval, by the leading Ottawa papers.

Two years ago Mr. Newsome became manager of the Westport Manufacturing and Plating Co., Westport, Ontario. He personally got out the plans for their new building, and installed the 50 horsepower turbine with draft tube and all necessary machinery to carry on the work. At that time the staff numbered 12 men, whereas now the firm has 50 on the payroll, and the factory is very busy.

Mr. Newsome, besides being a practical sanitary and heating engineer, thoroughly understands the process of manufacturing the various lines of plumbing supplies. He knows plumbing goods from the pig or ingot to the cardboard box, and his ambition since he first entered the trade, has been to live up to the title of "Sanitary Engineer."

Our readers may rest assured that The Sanitary Engineer, Plumber and Steamfitter will become even more valuable to them under Mr. Newsome's editorship than it has been in the past.

Mr. Newsome will adopt an aggressive editorial policy, which will make every issue of The Sanitary Engineer, Plumber and Steamfitter well worth studying, from cover to cover.

The first issue of The Sanitary Engineer under Mr. Newsome's supervision, will be that one containing the report of the big national convention in Montreal, June 10-12. The convention will give him a splendid opportunity for meeting representative sanitary and heating engineers from the Atlantic to the Pacific.

Those of our readers who will not be able to attend the Montreal convention are invited to become acquainted with Mr. Newsome by correspondence. In reporting to him their difficulties or explaining their views on the thousand and one problems of sanitary and heating engineering readers everywhere will help Mr. Newsome to make The Sanitary Engineer what he wishes it to become—the indispensable servant of every member of the craft.



EDWIN NEWSOME



Above illustration taken from front cover of Leaderite. Photoed courtesy of Leader Iron Works.

Take All In One Order

The Water Supply Equipment of country and water supply is now looked upon as work that legitimate belongs to the pipe fitter and should include the installation of power, whether gasoline engine, steam, electric motor, or water power, is most suitable for the plant. Architects to-day very generally link the water equipment with the plumbing specifications.

Gasoline Storage Outfits, have been largely considered an outside line, as far as pipe work contractors are concerned, and were usually sold by specialists. Why so, when it simply consists of a tank and pump, the installation being but a few moments work? Contractors should watch this field. The advancing price of gasoline encourages quantity storage. Make it a point to at least inquire of customers, who are automobile owners, if they have considered the advantage of a storage outfit, also Special Air Storage Tank and Compressor for inflating automobile tires. Those who are not content to pump air by hand, sometimes get mighty tired of pumping air by hand. Watch your chance. The rural people are buying both gasoline and air storage outfits. Someone will get this business, why not you?

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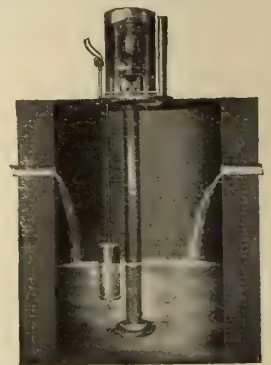
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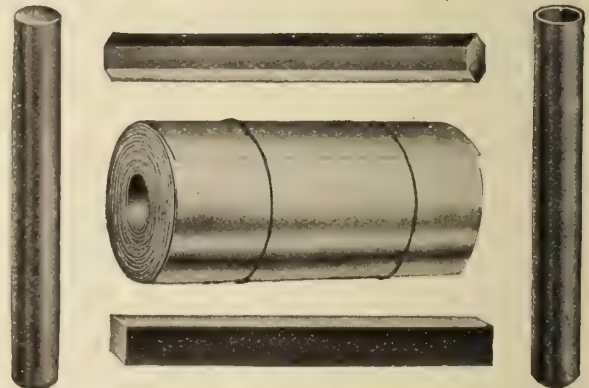
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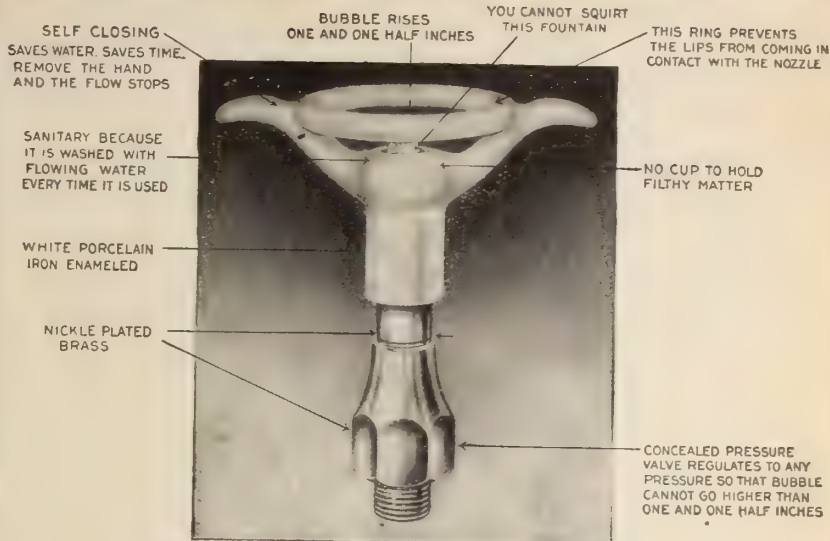
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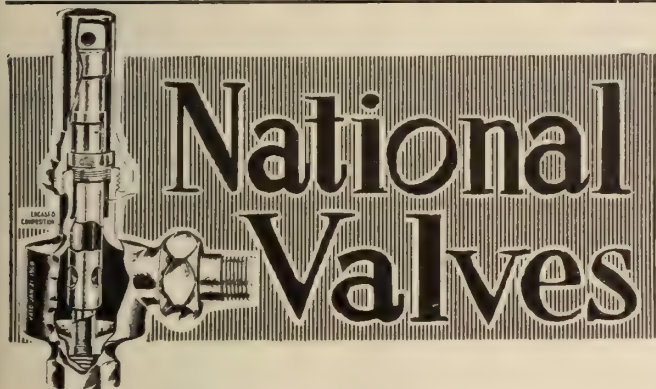
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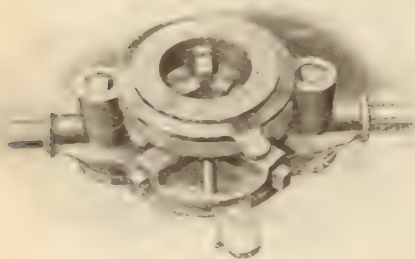
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It starts itself on the pipe, also throws itself out after a "Briggs" Standard Thread is cut instead of backing off, which spoils the dies.

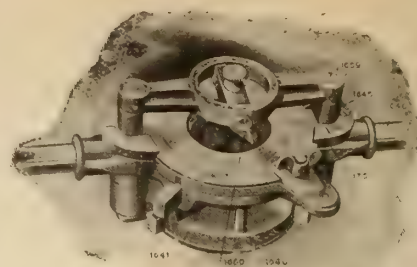
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The Die is made in such a way that it accomplishes by going over the pipe once what any other make of die would do in going over twice.

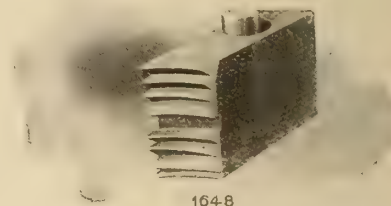
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Rear View of Die Stock



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Angle Valve with Yoke, Screwed,
Standard Pattern, Iron Body.
Composition Mounted.
Fig. 143



Check Valve, Horizontal,
Screwed, Standard Pattern
Iron Body

Fig. 151



Globe Valve with Yoke, Screwed,
Standard Pattern, Iron Body.
Composition Mounted.

Fig. 141

JENKINS BROS.' IRON BODY VALVES

are heavier and stronger than the average valves, and are unrivalled in design and workmanship. These valves are fitted with Jenkins Discs, and are guaranteed to keep tight in the very worst places. All parts are renewable, and the stuffing boxes can be repacked under full pressure when the valve is wide open.

Write for catalog which describes the full line of

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Jenkins Bros., Limited

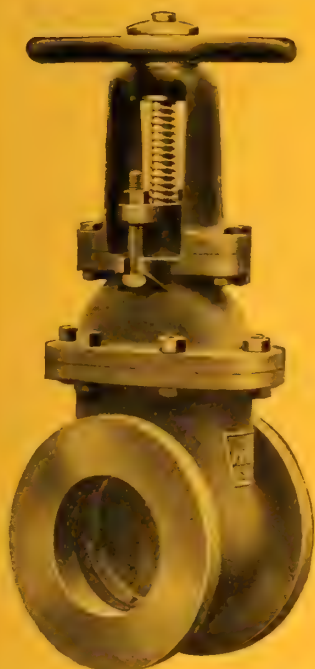
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KERR GATE VALVES

OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed in Seats

Deep Bronze
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Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

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Design.

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Interchangeable
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Tested.



4 1/2-in. and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

SPECIAL

We beg to announce that we have already embarked in the **JOBGING** of a **COMPLETE LINE** of **PLUMBERS' SUPPLIES**.

We carry a large stock of this material, which, coupled with our extensive line of **SUPERIOR BRASS GOODS**, enables us to give you unexcelled service on the following lines: —————→

Yours faithfully,

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is the best guarantee of their lasting qualities.

The wooden dowels and tongue and groove shown here prevent the joints from splitting or opening.

The Bull Dog trade mark on the end of any tank is proof that it is so constructed.

Every outfit guaranteed.

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CHICAGO, 140 S. Dearborn St.

WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VII.


Publication Office : TORONTO, JUNE 2, 1913

No. 11



THE STANDARD

COMPANY LIMITED
GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA



Ideal "Interchangeable Panel" BATHS

The body member can be used with the interchangeable panels to make this bath suitable for recess—right or left hand corner—end to wall—back to wall—or out in open floor.
Ask for booklet.

Plate F O 21—I P

BRANCH OFFICES AND SHOWROOMS			
TORONTO	MONTREAL	WINNIPEG	VANCOUVER
119 KING STREET EAST	42-44 BEAVER HALL HILL	76-82 LOMBARD ST.	410 CARTER COTTEN BLDG

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

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BRITISH COLUMBIA:
A. O. Campbell,
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MONTREAL WINNIPEG VANCOUVER

CATALOG FURNISHED UPON REQUEST

“Standard Sanitary”

Modern Bathroom



Design P—90.

This bathroom is extremely practical, as well as beautiful, and combines every modern sanitary idea.

The leading feature is the “Standard Sanitary” Glenroy tiled-in bath, with enameled front plate, concealed fittings and overhead shower.

The bath is built into the floor and walls, affording no place for dirt and moisture to accumulate. The enameled exterior is very attractive and easily kept clean.

The graceful Arcadia Lavatory, Foot Bath, and Extended Lip Closet with Enameled Tank and Ivorite seat make an unusually complete and artistic bathroom at a very reasonable cost.

“Standard Sanitary” Plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

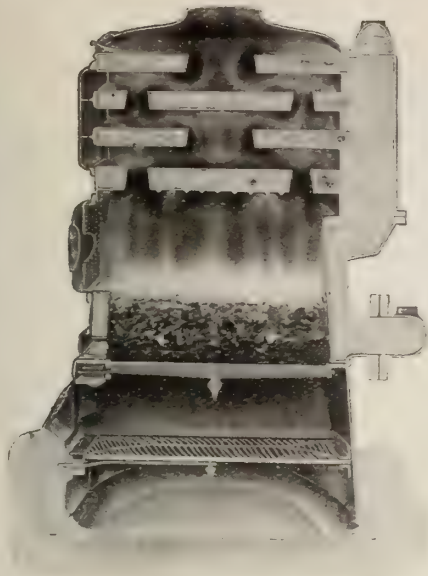
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

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The
"DAISY"
Hot Water Boiler

Over 50,000
in Use

Speaks for Itself!

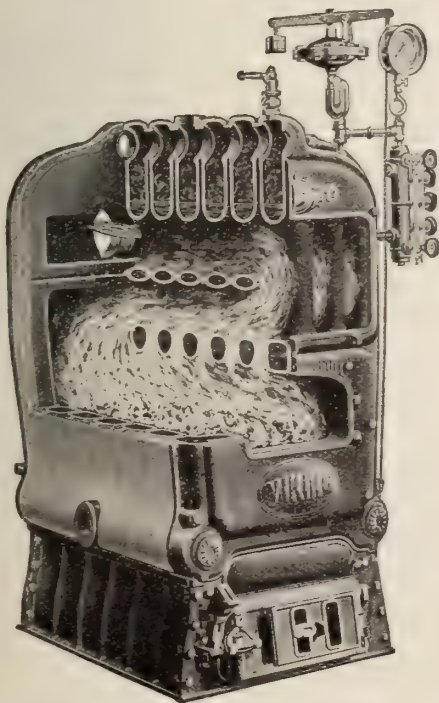


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We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



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"VIKING"
BOILERS

For STEAM or HOT WATER

Are Giving Great
Satisfaction

They are easily regulated
and kept clean.





Theory and Practice in Honeywell Hot Water Heating

It is one thing to theorize, another to practice. A theory successfully demonstrated is a proof of its accuracy—an assurance of truly scientific conception.

The universal success, the never-disappointing operation of the Honeywell hot-water system has proven conclusively that the theory upon which it is based is correct even to the utmost detail.

An increased and positive circulation; an instantaneous heat under perfect control; quickly increased or checked; the use of smaller valves and piping; the sending of even heat into radiators at extreme distance from boiler; the one-end radiator tap, the saving of floors from "butchery"; beams from weakening and ceilings from leak stains; minimum amount of piping an easy layout for the fitter, enabling expeditious placing of radiators, and the minimum cost of installation and operation.

All these points have been realized and proven by years of trial and thousands of plants in use in all countries.

Each feature combines to make the Honeywell the favorite method with house owners and the one generously and generally specified by far-seeing architects and heating contractors.

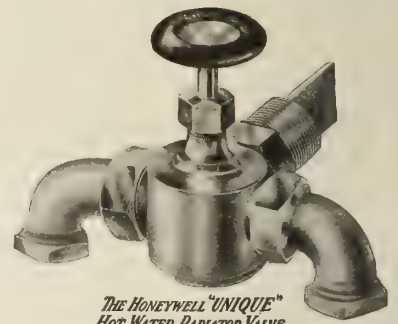
We would be pleased to furnish you with full information and engineering data.

Honeywell Heating Specialty Company

Wabash, Indiana

Frank T. Rawley,
Canadian Manager

Room 1008 Eastern Townships Bank Bldg., Montreal.
Phone Main 4615



THE HONEYWELL "UNIQUE"
HOT WATER RADIATOR VALVE



Hot Water Quick Opening Radiator Valve.

"MILLER" Hot Water and Steam Radiator Valves

The bodies and bonnets of our Hot Water Quick Opening Radiator Valves are made in one piece, thus having a great advantage over other valves, as it leaves one less joint or possible leakage. The cone-shaped Disc prevents sticking.

Our superior Steam Radiator Valves have very low seats and a high lift of Disc.

We manufacture both valves from 1/2 in. to 2 in., with or without union, also union elbows.

Every valve is thoroughly tested and has an unlimited guarantee. They are built for service. Ask your jobber for them.

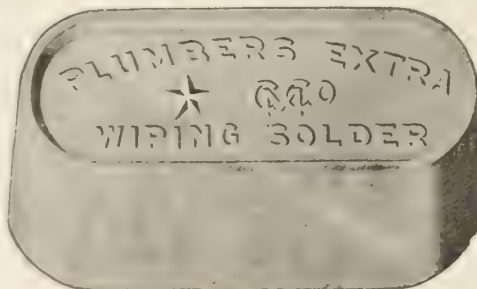


Steam Radiator Valve.

MILLER LIMITED - LONDON, CAN.

PLUMBERS' EXTRA STAR

The Highest Grade Wiping Solder. The same price as Cheap Solder. Why not use the Best?



For a First-Class Joint buy the Solder with the Tin in. Particular Plumbers Use only Extra Star Wiping.

Manufactured and Guaranteed by
Fraser Ave., TORONTO

The Canada Metal Co., Limited
MONTREAL

WINNIPEG

All White "MET-ALL"

Low Tank Closet
Combination

"The Best in Service"

The entire tank is made of metal, except the non-heat conducting filler which separates the water reservoir from the outside shell. This filler entirely prevents the gathering of moisture on the outside, commonly known as sweating. All the fittings are of the highest grade. The shell is made of a

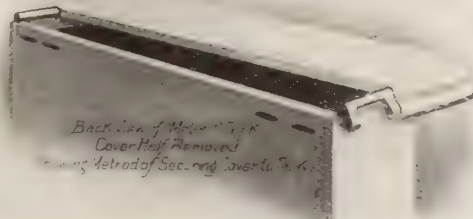
specially prepared metal and beautifully finished on the outside with a sanitary enamel, which does not discolor, and can be kept bright and new by simply washing.

The method of holding the cover is practical and effective. When the cover is in place, no screws or other device shows to mar the smooth finish of cover or tank.

The White Enamel Fibre Seat is the handsomest and most durable ever offered.

These seats are moulded of Wood Fibre, as hard as ivory and are absolutely impervious to moisture and acids. They will not split, warp, craze or discolor.

Write for descriptive circular and prices.

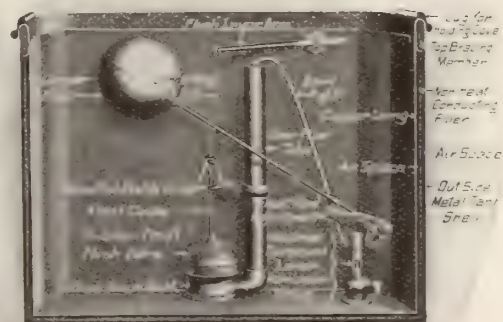


Ask us about the Thomson Smoke Machine—it's an efficient apparatus for testing plumbing. By forcing dense, pungent smoke into the plumbing system the machine makes every leak manifest by smoke issuing from it.

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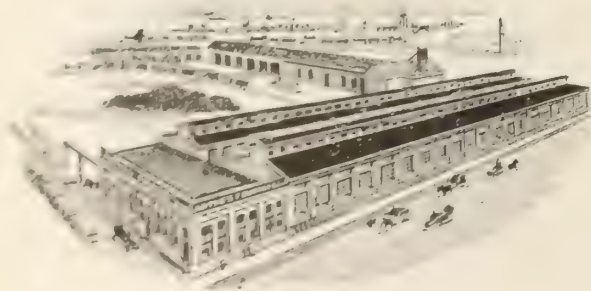


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CAST IRON SOIL PIPE AND FITTINGS

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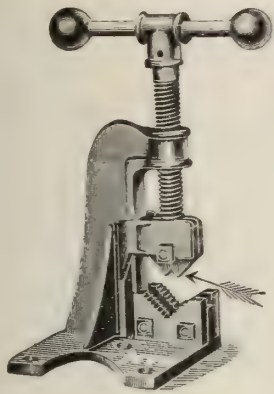


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WINNIPEG

When your tool kit is full of material and tools it is a hardship to add the weight of some vises.



The Nye Vise Is Different

It weighs a mere nothing, can be carried up a ladder with ease. On the staging it becomes a jolly good fellow, a chum of the plumber or steamfitter.

The Nye Pipe Vise takes sizes $\frac{1}{8}$ to 2 inches, including a 2-inch coupling. The jaws are made of fine tool steel, hardened and tempered. The long screw is made of cold rolled steel. It is so constructed that it grips and holds firmly without mutilating the pipe. The mechanism is especially simple and effective. There's just enough to it to do the business and do it right. I send this tool on a free trial, the same as my other tools.

NYE, THE DIE MAN.

The Nye Tool and Machine Works

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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, $\frac{1}{8}$ IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

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Works: Lachine Canal

You can talk across the continent for two cents per word with a WANT AD. in this paper.



To Messrs. Plumber, Steamfitter and Company

Gentlemen.—Good circulation in a STEAM HEATING SYSTEM is just as important as good circulation in the human body. When the circulation is bad, tenants get COLD FEET, which is always a bad omen. Chicago Pump Company's Automatic Electric Condensation Pump is the HEART OF THE SYSTEM. It is essential to perfect heating! Perfect heating is essential to paying property!

Never let a man tell you he cannot afford to install our Condensation Pump; the fact is, he cannot afford to be without it. It is far cheaper to pump Condensation water and air out of the system by electricity than it is to carry high steam pressure to force it through the Radiators and return lines. Steam is expensive! Coal and firing—labour are large items!

Our Pump eliminates water hammering in radiators and saves its own cost in one season; if it doesn't we want to know it.

SAVES DIGGING BOILER PITS.

CHICAGO PUMP CO., Chicago, Ill.

Agents wanted. Write for particulars.

STEEL AND RADIATION, LIMITED

OUR PRODUCTS

"KING" HOT WATER BOILERS,

Sizes 1 to 9½

"ROYAL" ROUND STEAM BOILERS

**"ROYAL" SQUARE STEAM and
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**"ROYAL" TANK and LAUNDRY
HEATERS**

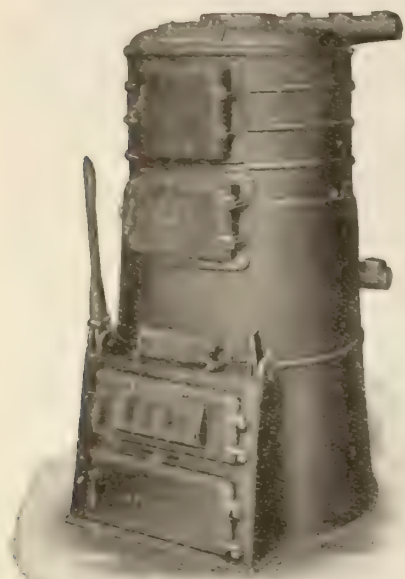
**"KING" and "IMPERIAL"
RADIATORS** Water and Steam

"Made in CANADA by CANADIAN People."

Install our products as outlined above and insure for your customer "Satisfaction" and prompt shipment, which means greater profit to you.

It is apparent now that the demand for Boilers and Radiators will be greater than last year.

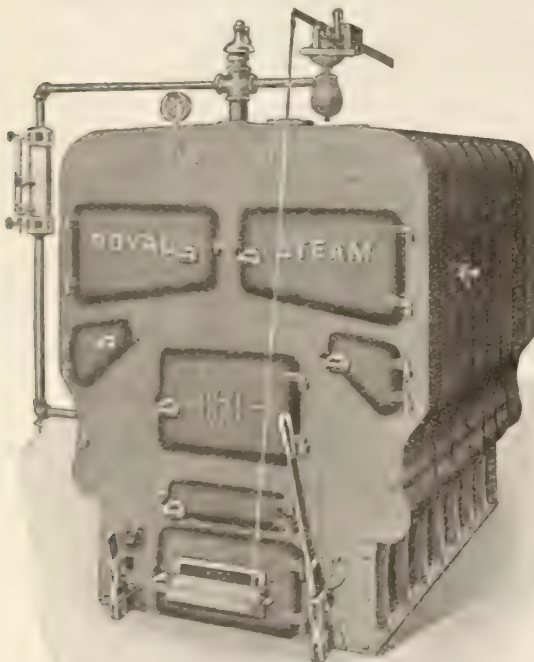
We are better equipped to meet this demand than any other manufacturer, with our new and modern plant at St. Catharines, together with our Toronto plant running night and day. Our output has been more than doubled.



No. 6 H. B. "King."

The "KING" Boiler is favored and accepted everywhere as representing

Efficiency of the highest type
at lowest coal consumption of
any boiler on the market.



"ROYAL" Steam.

Our "Royal" Round Steam
and Square Sectional Steam
and Water Boilers are consid-
ered by experts and users to
be the best on the market.

"King" Radiators are so
well known that it is only nec-
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We would draw attention to
our new "Imperial" Radiator,
made only in one and two co-
lumn plain, in every height.
See cut showing clear cut lines
and clean, smooth castings.



"Imperial" 2 column.

We appreciate your Radiator orders, but Boiler orders are
equally acceptable.

Try us for your steamfitters' supplies.

Catalogues mailed on request.

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Agencies in all the leading Cities in Canada

Biggest Convention on Record Promised



View of Technical School, Montreal, where the Canadian Society of Domestic Sanitary and Heating Engineers will hold their eighteenth annual convention on Tuesday, Wednesday and Thursday, June 10, 11, and 12.

Secretary of Association Has Already Received Word From Sixty Members to Effect That They Intend to be Present—150 Delegates Expected—Discussions Likely to Come Up—All Arrangements Now Well Under Way.

The time for the eighteenth great annual convention of the Canadian Society of D. S. and H. E. is fast coming round. Indications are for the greatest gathering of the clans ever known in the annals of the Canadian Society, and men from East to West look forward to this convention as one of the most important and most conspicuous milestones in the march of progress, which is steadily being made by this society. Preparations of all kinds are rapidly coming to a head. Dates have been definitely fixed for June 10 to 12 and all arrangements completed with the various railroad companies for securing cheap rates to this, the greatest of all great Canadian sanitarians' conventions. Early last week assurances had been received of an attendance of more than sixty, and figuring on others who would not fail to come, the committee have arranged for the accommodation of 150 delegates. Prince Edward Island on the East and Vancouver on the West will be the only limits to the territory represented in Montreal at the coming convention. A fine program of entertainment has already been arranged, covering all spare time away from the convention, and during hours of session many questions of vital importance will come up for discussion. All for one and one for all, which in former times has been the keynote of the association, will again prove itself the centre about which will radiate all discussions dealing with the interests of association members.

Within a few days now from coast to coast will commence a march to Montreal by all actively interested in association work, and the best interests of the trade of the sanitary and heating engineers throughout Canada.

Arrangements for the eighteenth annual convention are fast coming to a head, and the Montreal local association feel that so firmly have they laid the foundation for this convention that should they receive the hearty co-operation which they now expect of the trade throughout the Dominion this convention will prove itself the most successful in the history of the association, and will long be remembered as an epoch in the annals of the craft.

What John Watson Says.

Commenting upon this convention, John Watson, of Montreal, chairman of

the heating and ventilating committee, and an active association worker, stated:

"We are preparing for the greatest convention ever, and the Montreal Association is going to give the delegates a great time. Securing the lecture hall of the Technical School for convention rooms will be a great thing, and gives assurance of a successful convention.

"We are not going to have lectures this year as usual, but will have discussions of all important issues that concern the trade at the present time. We feel that this plan will be more practical and helpful than theoretical lectures, which are soon forgotten."

A Fitting Place for Convention.

Montreal has long been recognized as the headquarters of the Montreal Association. Early in the history of the so-

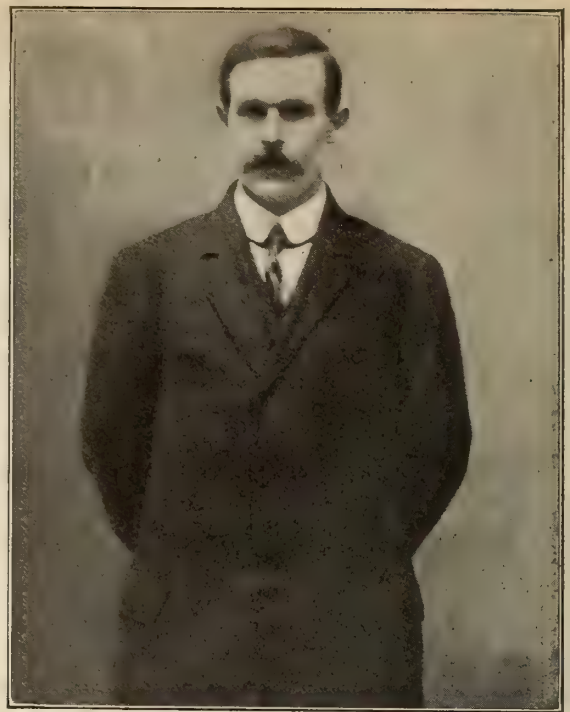
ciety the members had confidence in Montreal, and elected to the presidency Montreal men. Even throughout later years Montreal men have stood well to the front and shown themselves keenly interested in promoting the welfare of the association and in effecting their share of the splendid progress which the society has made.

It appears very fitting, then, that once more the members of this association should gather in this city and combine their efforts with those of the Montreal veterans.

Montreal is also one of the oldest established cities in the Dominion, and in arranging the programme of the convention the committee have endeavored to combine business with pleasure in such a way that each will be distinct, but that while in Montreal delegates



A. W. GARDINER, Montreal, Provincial Vice-President for Quebec.



W. J. WEBBER, Summerside, Provincial Vice-President for P. E. Island.

East Against the West.

Again the powers of the East have been pitted against those of the West. This time the strife is to be in the form of a bowling match, which will take place on Wednesday evening, June 11, at the greens of the Club Canadien. At

given by both sides as to the various causes for loss or winning out. The bowling match will again be brought on to prove superiority of skill, and a keen game is expected.

Other events of equal importance have been arranged for by the entertainment committee, who have spared no efforts to make their part of the convention a brilliant success. Programme in full to date is given further down.

Discussions to Come Up.

One of the more important topics likely to come up for discussion before the convention will be the advisability of adopting a standard for ordinances throughout the Dominion. After having entered into this matter enthusiastically in Winnipeg when discussing a uniform code for the West, Western men will undoubtedly be keen about further action being taken to secure a code which will be even more far-reaching than the one now being drawn up for their territory. This is one topic which has long been under discussion both in Provincial and Dominion conventions. It is thought likely, however, that even greater developments will be achieved this year than ever before, and that some definite conclusion may be arrived at.

The question of appointing a paid secretary for the association is also likely to arouse much interest. Up to the present the association has been working along, receiving only such time from its various officers as these officers feel they can spare from their own private business. Under such circum-



A. J. HAMMOND, Winnipeg, Provincial Vice-President for Manitoba.

entertainment committee have definitely announced their programme, which provides for many events of interest.

former conventions keen interest has been taken in watching the results of these conflicts, and various reasons



R. J. PRIESTLY, Calgary, Provincial Vice-President for Alberta.



S. A. WYE, Vancouver, Provincial Vice-President for British Columbia.

stances remarkable progress has been made, and with a permanent paid secretary to look after all routine work even greater things might be accomplished, as it would then be possible for other officers to devote more of their time to the vital questions coming up before the association. A move in this direction would undoubtedly be in the right direction. Many members have already heartily concurred in the proposition, and have expressed the opinion that they would like to see some definite action taken at the coming convention.

Reports will also be presented by the chairmen of the various committees as to the progress made in their several departments. Committees with chairmen are as follows:—Apprenticeship, J. Marshall, Port Arthur, Ont.; Essay, Wm. Mansell, Toronto, Ont.; Heating and Ventilating, John Watson, Montreal, Que.; Legislative, L. Le Grow, Toronto, Ont.; and Sanitary, Geo. Clapper-ton, Toronto, Ont.

The Opening Day.

Although a meeting of the executive is called for Monday night, June 9, the convention will not open formally until Tuesday morning. Most of the morning will be spent in receiving and welcoming delegates, in the city's entertainment committee extending the official welcome, and in whatever business the committee considers deserves such prompt attention that it requires to be rushed through at an early date.

The managing committee have expressed the desire that all those intending to go to the convention make it a

point to be present for the first sessions in order that no time will be lost in getting down to business, and thus not derange the general programme. Too often much time is wasted at the first, and when closing time comes so much business is still up before the associa-

else to cause lack of interest on the part of those who have gone to some trouble to be present at the convention.

With this feeling uppermost, the committee in charge request that every member take into consideration the time and other interests of the various mem-



A. C. WALTZ, Port Arthur, Provincial Vice-President for Ontario.

tion that none of it receives proper attention if touched upon, and if shelved over, is liable to become forgotten, or

bers present, and make it a point to be there for the start and not delay the convention. The reason for this re-

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

quest is quite obvious, as every member will readily see.

Attendance Expected.

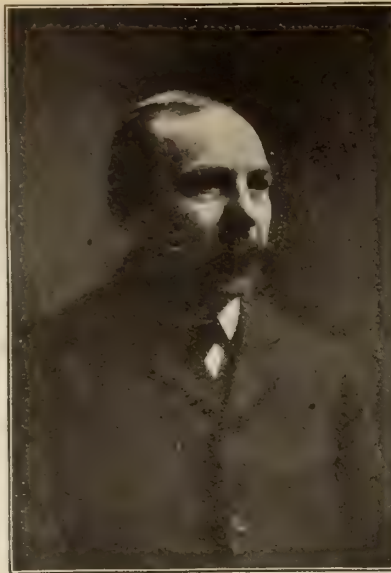
As to attendance, word had already been received last week from outlying points that fully sixty energetic association workers would be on hand. Arrangements have been made, and accommodation provided for fully twice that number, 150 being the sanguine expectation of the committee.

Regarding those who intend to be present, the Montreal local association earnestly request that they be notified early as to such intentions on the part of all members in order that final definite arrangements be made.

Judging from reports, the greatest convention on record is promised. It is now up to every member to see that these reports are fully confirmed, and that this convention be made one, the fame of which shall be told at all succeeding gatherings.

Programme to Date.

Following is the programme of the eighteenth annual convention of the Canadian Society of D. S. & H. E., in so far as it has been arranged to date:



JOHN WATSON, Montreal. An active and energetic association worker.

Monday, June 9.

Meeting of Executive Committee at Freeman's Hotel, at 8 p.m., at which final arrangements will be made for the programme of convention. Subjects for discussion will be decided on at this

meeting, also the speakers will be picked at this meeting.

Tuesday, June 10.

Official opening of convention at 9.30 a.m. Second session at 2 p.m.

In the evening the delegates will be given a treat at the Orpheum Theatre, where the play "Virginia" will be presented.

Wednesday, June 11.

Session at 9 a.m., at which officers for ensuing year will be nominated.

Session at 2 p.m., after which a boat ride will be taken around the harbor and a visit made to the floating dry dock.

At 8 p.m. a bowling match will take place on the greens at the Club Canadien, 350 Layauchetiere Street East. The opposing teams will be the pick of the West against the best bowlers in the East.

Thursday, June 12.

Session at 9 a.m., at which election of officers will take place.

Session at 2 p.m., when delegates will have a conference with the supply houses.

4 p.m.—A trip will be taken around the city on electric cars, during which a photo of the delegates will be taken.



*J. S. WALSH, Montreal,
Past President*



*E. J. YOUNG, Calgary,
President*

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

The trip will end up at Dominion Park, the "Coney Island" of Montreal, where a banquet will be tendered by the Montreal Association and the supply houses, after which the evening will be spent in the "Midway."

Hotel Accommodation.

Accommodation has been arranged for at three hotels—the Queen's, which will be the official headquarters; Freeman's and the Windsor. Location, rates, etc., are as follows:

Queen's Hotel, corner of St. James and Windsor Streets—just across from G. T. Station and two blocks south of C. P. R. Windsor Station. American plan. Rates—\$3.00 per day per person for room with running water, or \$4.00 per day per person for room with bath, two delegates taking one room.

Freeman's Hotel, 182-188 St. James Street and 143-145 Notre Dame Street W. Take Windsor car from both C. P. R. Windsor and G. T. R. depots. Car stops at hotel door. Rates same as Queen's.

Special Rates Secured.

The following letter endorsed by the Canadian Pacific. Canadian Northern

and Grand Trunk Railways has been received by Secretary-Treasury Jas. Marr, of Calgary, and is self-explanatory:

Mr. Jas. Marr,

Calgary, Alta.

Dear Sir,—Eighteenth annual Convention Society of Domestic Sanitary and Heating Engineers, Montreal, June 10th-12th, 1913.

With reference to your application for reduced fares in connection with the above mentioned convention, the following arrangements will be applied in connection with meeting referred to:

Territory—From Ontario (west of Port Arthur), Manitoba, Saskatchewan and Alberta.

Going Arrangements—Passengers to purchase regular one-way tickets, via desired route to Montreal, taking receipt for fare paid on standard convention certificate, which, when duly signed by secretary of convention and validated by special agent at Montreal, will be employed in securing return ticket at fare authorized.

Going Dates—June 4th and June 8th, 1913.

Return Fare—If 49 or fewer are in

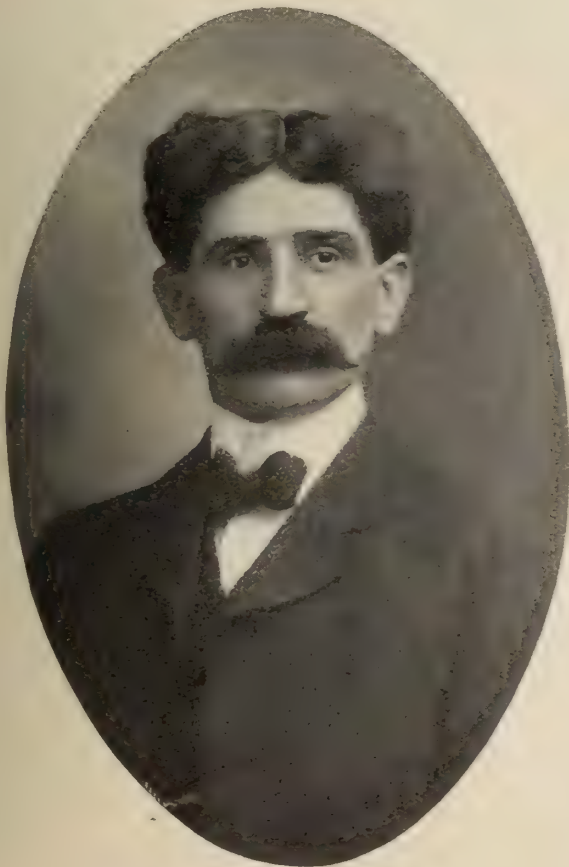
attendance ticket to be issued for return journey at two-thirds regular one-way fare, plus 25 cents. If 50 or more are in attendance tickets to be issued for the return journey at one-third regular one-way first class fare, plus 25 cents. If 300 or more are in attendance tickets to be issued for the return journey at 25 cents.

Return Limit—June 27th, 1913.

Extra amounts for use of lake routes. Additional amounts, as shown below, will be charged for return tickets when lake route is used by passengers in one or both directions.

Going lake route, via Fort William or Port Arthur, returning all rail	\$ 4.00
Going lake route, via Duluth....	6.50
Going all rail, returning lake route, via Fort William or Port Arthur	9.00
Going all rail, returning lake route, via Duluth	11.50
Going and returning lake route, via Ft. William or Pt. Arthur..	13.00
Going and returning lake route, via Duluth	18.00

Fares via lake route include meals and berth while on steamers of the



*H. MAHONEY, Guelph,
Vice-President*



*JAS. MARR, Calgary,
Secretary-Treasurer*

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Northern Navigation Co. and the C. P. S. S. Line.

CO-OPERATION THE KEYNOTE.

"The Master Plumbers' Association of Montreal is in fine shape and growing every year," said ex-President Peter C. Ogilvie, of Ogilvie Bros., Bleury Street, in an interview with a representative of Sanitary Engineer. Continuing, Mr. Ogilvie said: "We have gone along quietly and have accomplished much to improve trade conditions. There have been some important issues brought to the attention of the association in the last year, but the most important one was the protest of the Master Plumbers against the supply houses drawing up heating plans and estimates for those who were not eligible to the trade. Some of the supply houses had drawn up the estimates and plans for the heating apparatus on a number of jobs in Montreal for customers who were not master plumbers, and, while the master plumbers were not discriminated against in the matter of

prices, they contended that the supply houses should discontinue this. It cost the supply houses more to sell to these customers than to the master plumbers. The association," continued Mr. Ogilvie, "took up this matter with the supply houses, and they promised to discontinue the practice."

Mr. Ogilvie regretted the rivalry that exists between Ontario cities and Montreal, and quoted many instances where Montreal development had been belittled in newspaper reports. This condition, he claimed, should not exist, and each city should try to be a help to sister cities rather than a stumbling block. The Montreal association, he stated, was working with that end in view, and would appreciate the co-operation of other associations to make the Master Plumbers' Associations one big brotherhood for the advancement of the trade.

COMMITTEE IN CHARGE.

The Convention Committee now acting in Montreal is composed of the fol-

lowing men: President, W. P. Baxter; Secretary-Treasurer, O. J. Delaney; Chairman, A. W. Gardner. Other members—J. A. Gordon, Jno. Watson, J. E. Walsh, A. Charrette, W. Ryan, J. Thibeault.

The following representatives of the supply houses are also on the Convention Committee:

Jas. Robertson Co., Ltd.—W. P. Baxter, A. Bonham, C. Forest.

Thos. Robertson Co., Ltd.—H. Lamontagne, O. J. Delaney, S. P. Brewer.

Standard Ideal Co., Ltd.—J. J. Lafirme..

Standard Sanitary Co., Ltd.—J. Collins.

Steel Co. of Canada, Ltd.—G. Clewes. Canada Tube and Iron Co., Ltd.—A. Hough.

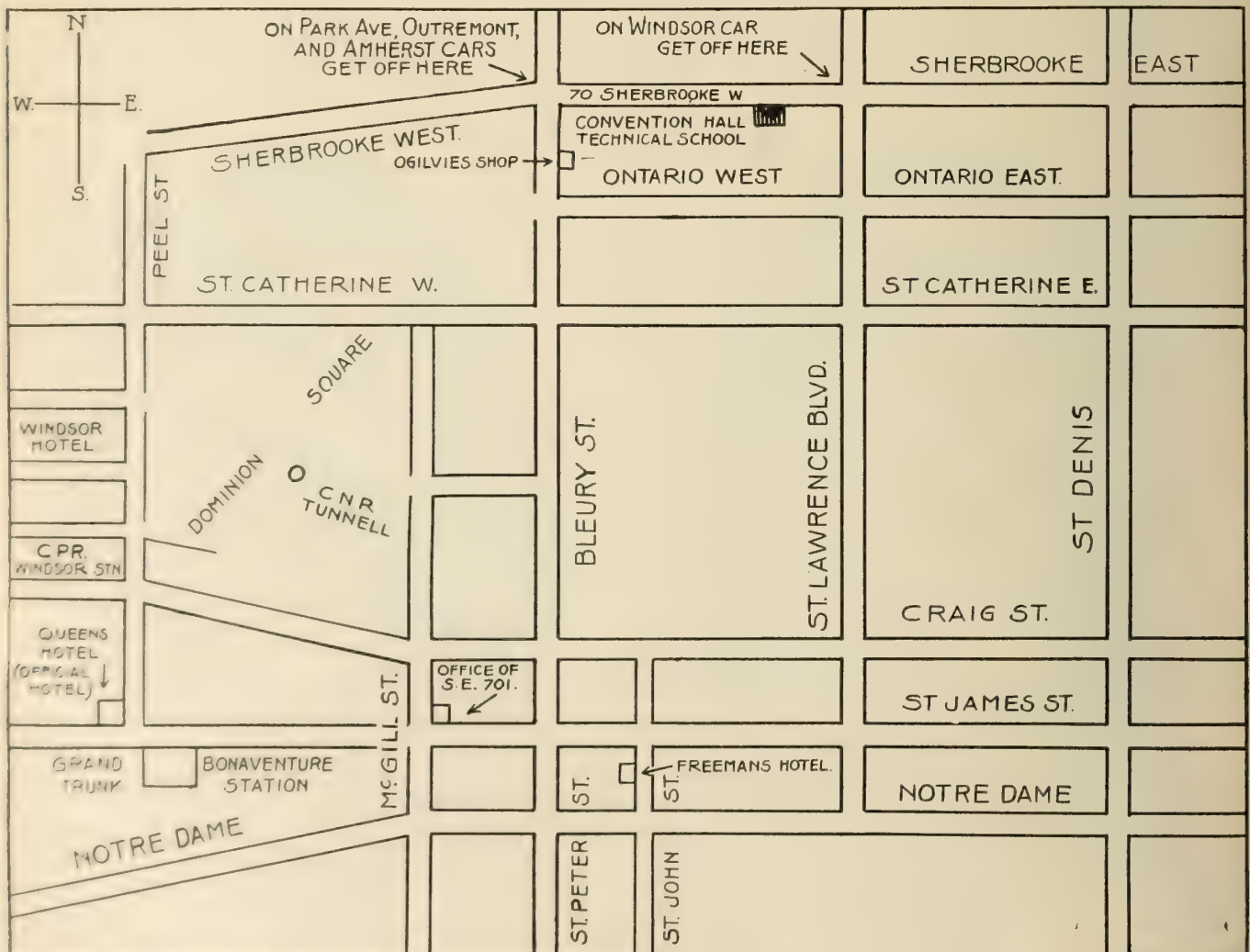
Twyfords, Ltd.—F. Haselden.

J. L. Mott Iron Co., Ltd.—T. P. Senecal.

Fittings, Ltd.—L. Payette.

Canadian Trenton Potteries, Ltd.—Mr. Fielding.

Jenkins Bros., Ltd.—Representative unknown.



Plan of city of Montreal showing main streets in section of the city around hotels and convention hall to be occupied by the representatives present at the annual convention of the Canadian Society of D. S. & H. E., June 10-12. Note the position of the Queen's Hotel, the official headquarters, also of the Windsor and Freeman's Hotel. Note too the location of the Technical School where the convention will be held. Streets number east and west from St. Lawrence Blvd.



SIDELIGHTS ON PROMINENT MEN IN THE TRADE.

1.—President Young, of Calgary, will make a capable presiding officer. 2.—Harry Mahoney, of Guelph, is the stormy petrel of municipal politics in the Royal City. 3.—James Marr, of Calgary, is working hard to level off civic ordinances and get them down to a standard. 4.—John Watson and the ubiquitous cat. 5.—It is reported that Ed. Higginbottom will make this trip in his calamity cart. 6.—Arthur Gardiner, of Montreal, will head the welcoming festivities.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription: Canada \$1.00 per year.
United States, \$1.50, Great Britain and
Colonies, 4s. 6d.; Elsewhere 6s.

CARE OF ADDRESS
Maclean, Toronto, Atank, London, Eng.

JOHN BAYNE MACLEAN, - President
J. G. LORRIMAN, - - - Manager
T. B. COSTAIN
W. S. FARQUHARSON } Editors

Circulating amongst Plumbers,
Steam, Hot Water and Gas Fitters,
Sanitary Inspectors, Heating and
Ventilating Engineers, City Engineers,
Boards of Health, Architects, etc.

TORONTO, JUNE 2, 1913

The National Convention

The time for the eighteenth annual convention of the Canadian Society of D.S. & H.E. is fast drawing nigh and judging from reports which have been received up to the present time, this is going to be one of the most successful conventions ever held by this association. No effort has been spared by the committee in charge in Montreal to make the three days, June 10-12, spent in that city a red letter day in the history of the trade. The entertainment committee have already announced their program complete. Every preparation has been made for a most enjoyable outing for all the delegates, and in such a way as not to conflict with the all important business sessions of the convention. Many problems of supreme importance to the trade will undoubtedly come up, and brushing up against the wit and wisdom of other members coming from the whole of the Dominion, there is not the slightest doubt that members will return home feeling that they have been benefited and fully justified by the time and money thus spent.

Reports say that this is to be a red letter convention. It is now up to every member of the association to justify reports by helping in whatever way he can and thus to prove the truth of statements now being made.



New Series Begins

Continuing with this issue a new series entitled "Setting and Connecting Range Boilers" begins. By this time readers of The Sanitary Engineer have become well acquainted with "Phoenix" and have learned to appreciate his articles. In this series "Phoenix" intends running from four to eight strong, practical, and illustrated articles on the various methods of connecting up range boilers which have been proved most successful by long years of experience.

All articles will be written in a free and easy style without being loaded up with too much technical phraseology, so that they may be followed out easily by even the youngest in the trade. This is a subject with which has been found much difficulty in securing a practical satisfactory explanation. Dealing as this series will with every practical phase of the subject The Sanitary Engineer hopes to clear away some of their difficulties, and to solve all problems which have had to be confronted in dealing with range boilers in the past.

University Training for Sanitarian

That the Dominion Government spends about \$10,000,000 a year on military matters, and not a cent to fight typhoid fever which is killing thousands of our people every year, is the striking statement recently made by Geo. Bradbury, M.P., chairman of the special committee appointed to deal with the pollution of rivers and streams in Canada.

Would it not pay the government to employ a special board of sanitary engineers to deal with this problem? Though not so much before the public eye, it would seem fully as important to spend money on the protection of public health as on military protection, display, and splendor.

Up to the present time no allowance has been made in any university for a course of sanitary engineering. Consulting engineers, hydraulic engineers, and those who have devoted their energies to the study of sewage problems feel the need of a definite step being taken by the government to provide chairs of sanitary engineering in the various universities.

Should the problem be taken hold of systematically it is claimed that typhoid would be reduced 300 per cent., and that the probability of typhoid epidemics breaking out would be very much lessened. Were any such marked change to result, there should be no hesitation whatever in giving the problem a thorough investigation and fair trial.

William Kennedy, consulting hydraulic engineer, R. S. Lea, hydraulic engineer, and C. H. MacLeod, vice-dean of the Faculty of Science at McGill University, all Montreal men, are some of those who are taking outstanding parts in promoting a step in this direction.

As it would take some time to train men as specialists in sanitation, Wm. Kennedy suggests that appointees of a sanitary board make themselves conversant with every phase of the problem, and in order to do this, they visit other countries and examine systems and conditions there.

Both these suggestions are of primary importance and appear directly in line with the correct course to be pursued. The question of sanitation is one amongst those of most vital importance ever touched by parliament, and should be gone into most thoroughly regardless of expense. Too long now it has been left in the background, and it is to be hoped that some definite decided action will now be taken.

A Review of the Business Situation

Some Reports From the West Are Not Entirely Satisfactory, But the Eastern Provinces Are Enjoying a Wide Measure of Prosperity and Industrial Activity—Some Opinions From Prominent Men—An Outline of the Financial Situation.

There is only one thing wrong with business in Canada at the present time. Money is tight; and promises to remain that way for the greater part of the year. This has affected business conditions in several ways, the first evidences being found in the slowness of collections. In the West paper has been renewed to an extent which has caused credit men considerable thought and worry. In the Eastern provinces, the collection problem has been less serious. Retailers have met their obligations just about as well as ever in Ontario and the East. One fact can be stated here broadly and unreservedly. There is no danger of the Eastern provinces suffering any setback this year. Business is too brisk and conditions too generally sound.

In the West, the money stringency is due to unwise speculation in real estate. Too much money is tied up in land. Business is proceeding briskly, however, and as the tide of immigration is rising to unprecedented levels, there is no reason to anticipate any falling off in commercial activity. Just as soon as the money situation loosens up a little, the march of Western progress will be resumed.

The one marked effect which the money tightness has had is the elimination of unwise speculation and rash adventuring. Conservatism has become general. Business men are putting a greater degree of prudence into their operations. It is this cautious tendency which has caused some to see signs of impending depression, mistaking the drawing in of business lines as evidences of weakness rather than as a change of policy. Well posted men regard the situation as somewhat in the nature of a blessing in disguise, as it has brought about a more sane attitude.

From the standpoint of the hardware trade, all prospects are for a busy year. Reports from the various centres indicate that the manufacturers and wholesalers are finding demand heavy and continuous.

The East is Prosperous.

An Ontario jobber writes to The Sanitary Engineer:

"Business in Ontario is good. We are not anticipating a record year, but each month shows an increase over the same month of the previous year, so we have no cause for complaint. We fully anticipate that this will be maintained throughout the year.

“As to collections, we do not find any reason for alarm or for serious complaint, as far as Ontario is concerned. There are plenty of men renewing their paper and holding back, but we find that the same men have been hard to collect from for years. Certainly there has been no more difficulty this year in the matter of collections than in past years.

"Whatever difficulty there may be this year is due to the laxness that sanitarians show in getting their own collections in rather than to a weakness in conditions generally."

The Western Field.

A representative of a house which does a large business in the West writes:

"We are not proceeding cautiously with respect to the West. Certainly collections have been slow, but, so far as plumbing supplies are concerned, I believe that we have less to complain of than manufacturers in other trades.

"We do not regard the situation as alarming. In fact,

we are selling quite as much in the West as ever and expect to be getting increases again as soon as the money begins to circulate a little more freely."

Expansion of Trade.

A manufacturer says:

"Not having studied the outlook very closely' I am not able to give any forecast of business developments generally. Speaking for hardware and kindred lines, however, I do not think there is any doubt that a brisk year is ahead. With hundreds of thousands of people pouring into the West, the demand from that quarter cannot help but grow."

The Financial Situation.

Summing up the monetary situation, The Financial Post says:

“At the present juncture, although there are some occasional returns to the contrary, the outlook for busi-



*Why Stocks are Dull' — McCutcheon in Chicago
Record-Herald.*

ness in the whole of Canada has not changed materially during the week. There has been accentuation of the cautious attitude, being taken by both jobbers and manufacturers. They are realizing the necessity of keeping well within the credit limits established last year. In doing this they have of necessity to force collections, which during the week caused business mortality to be a little heavier than normal. It has been found also that drafts are being returned because of trifling causes, and many of the houses who customarily take cash discounts are taking advantage of all the time they can. This condition of affairs is more marked than usual.

Will Hold Annual Picnic in Berlin

Toronto Association Making Arrangements for Big Day of Entertainment—General Rallying Day for Western Ontario Trade.

The picnic committee of the Toronto Society of D.S. and H.E. have finally decided to hold their annual picnic in Berlin on July 5. Many other towns, including Coburg, Galt, Preston, and Guelph, extended very hearty invitations to the Toronto association to make their towns the headquarters for this day of entertainment, but decision was given in favor of Berlin.

To make the day as much as possible an outing for Western Ontario sanitarians is now the aim, and to that end invitations have been sent out to the various branches of the trade in Galt, Preston, Guelph, Hespeler, Berlin, Brantford, Hamilton and several other surrounding towns. Though the picnic excursion is in no way connected with the provincial association, the gathering at Berlin will be representative of a large section of the province, and a rallying day for the trade.

Sports of all kinds are being arranged for, the main feature being a baseball match between Toronto plumbers and a team chosen from the trade in outside towns. Races and special games will be provided for the "babies and ladies," so that the day will prove a great outing for all.

Dinner and tea will be served right on the grounds at Victoria Park, where the picnic will be held.

Excursionists will leave Toronto by C.P.R. morning train to Galt, and proceed from there by the Berlin Galt and Hespeler Railway to Berlin. Special cars have been arranged for on the latter line.

The committee in charge are as follows:—D. Glynn, chairman; T. B. Smythe, H. Ruddick, F. Gentle, W. Boddington, H. A. Farthing, J. E. Fullerton, H. J. Hillier, and E. T. Needham.

Up to this time the firm had built a few pipe threading machines which were giving good satisfaction and business in this line began to grow. In view of the great possibilities of this Dominion, especially the rapid development of the West, the firm decided to specialize in this line. Every energy was directed to the development and perfection of machines specially constructed to meet the requirements of the trade. They claim as proof of this accomplishment that their machines are now in operation in all the tube-mills, and many of the leading plumbing and steam-fitting plants in Canada.

The Dalhousie Street premises being too small the present factory was built three years ago. It is a substantial three-storey building with offices at corner of Centre and Bridge Streets, and is now becoming too small to take care of the increasing demand for the Hall machines.

In January, 1912, a charter was granted authorizing the formation of the company now known as the John H. Hall and Sons, Limited, capitalized at \$100,000.00 with the following officers:—

President, John H. Hall.

Vice-President, Leslie S. Hall.

Secretary and Treasurer, Winton E. Hall.

Director, Ernest L. Hall.

Director, Reginald A. Hall.

Another Year Shows Continued Success

Brantford Firm Passes Tenth Milestone—Years of Firm Marked With Prosperity—Arose From Very Humble Beginning.

On May 4, the firm of John H. Hall and Sons, Brantford, Ont., manufacturers of pipe threading and special machinery, celebrated their tenth anniversary. Commencing ten years ago, the firm had a very humble and small

staff, and employees. Soon however business increased to such an extent that a partnership was formed between the four sons and father, and the name John H. Hall and Sons adopted.



beginning. Machinery consisted chiefly of one lathe and drilling machine, and the business was carried on in an old building on Dalhousie Street. Upon repair and jobbing work the firm began to get its standing. At that time it was known simply under the name of John H. Hall, who, with his two sons, E. W. and A. R. Hall constituted management, of-

Upon this move being made a few more men were employed and the business extended to the limit when the firm commenced to cater to the manufacture of special machinery, and discontinued much of the small jobbing. This line was very successful, and embraced the manufacture of many new machines for special lines of work.

IMPROVING CONDITIONS IN POORER DISTRICTS.

Toronto, Ont.—Amendment has been made to the Health Act of this city, allowing the Health Department to install sanitary appliances in private homes, and collect by easy payments. This amendment is for the purpose of making it possible to render sanitary such districts as are occupied by people who are not in a financial position to pay for these improvements immediately. Letters are being sent to all premises known to be in need of improvement, and with these, announcement of terms of payment is given.

There is some talk of the city employing a staff of plumbers to look after this work, but no definite action has yet been taken.

Winnipeg, Man.—The Hackney Tile and Manufacturing Co. have purchased a site on Higgins Avenue and May Street, on which a large warehouse will be erected. The members of the new firm are D. M. Hackney, Winnipeg, with whom will be associated J. G. Ferguson, Sault Ste. Marie, Mich.

Cutting and Welding by Oxy-Acetylene

Method Fast Coming Into Use by Which Incisions Can Be Made in Thicknesses of Metal in a Few Seconds, and With Which Valuable Pieces of Machinery May be Repaired—Description of Process Employed.

What uses the oxy-acetylene torch can be put to are as yet somewhat uncertain, but undoubtedly there is a great future for it, both for cutting and welding. Not only has the oxy-acetylene process of welding completely replaced the system as followed out commonly some years ago by blacksmiths and small machine shops but it has brought into existence an entirely new branch of trade, namely the saving of valuable pieces of machinery which hitherto were lost owing to fractures, or to parts having been worn out through constant use.

When a process of this kind comes into use there is bound to be a demand for it sooner or later, whether those who have hitherto been laboring with more primitive means oppose it or not. In Canada, and all over the world the

When the Quebec bridge fell in 1907, ten thousand tons of steel were carried down in a tangled mass of bent and twisted members. The oxy-acetylene cutter was found invaluable by the contractors in cutting the mass of steel into lengths convenient for handling. In that way the wreck was cleared up in a remarkably short time.

A piece of work recently done in the Toronto Electric Company's power plant will illustrate the use of the flame as a cutter. Two long wheel rooms required to be dismantled hurriedly, and the only way of solving the problem was to cut through 6 inch steel shafts every 45 inches. Owing to the situation of the shafts in the basement and running along two narrow chambers the work was much cramped, and to have gone to work with a common hack saw would have been a very trying process. The oxy-acetylene cutting torch was employed; twenty cuts were made; and the average time for each was 2 minutes.

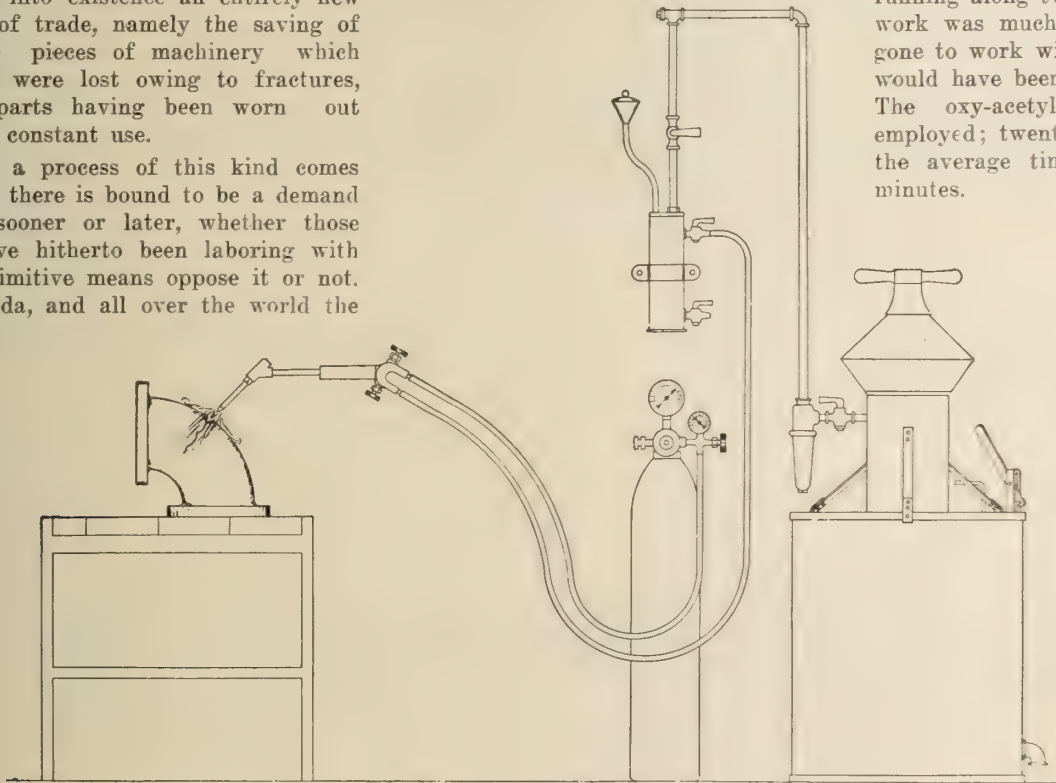


Fig. 1.—A complete oxyweld equipment.

The plant consists of: 1. Siche gas generator (special welding type.) 2. Hydraulic back-pressure valve. 3. Oxygen pressure regulator, indicator, and oxygen bottle. 4. Hose. 5. Torch, and 6, iron table with fire-brick top.

oxy-acetylene process is rapidly gaining ground, so that in a few years, it is claimed, the whole machinist trade will be revolutionized through its almost absolute introduction.

Many records of various kinds have been made with this torch. Six inch shafts have been cut through in six minutes; sections of 1½ inch boiler plate four inches in diameter have been entirely removed in less than a minute, and pieces of machinery of various kinds have been built up and made whole again in a few minutes time.

Cutting With a Torch.

Perhaps the most interesting phase of the whole oxy-acetylene process in so far as it concerns the trade of the sanitary and heating engineer, is its ability to make rapid incisions through metal of almost all kinds.



Fig. 2 A—Cutting 6-inch shafts in 6 minutes.—Courtesy of the Siche Gas Co., Toronto.

Description of the Apparatus.

Before going into the process of either cutting or welding, a description of the apparatus employed will be of value. The apparatus described here

On the right is the acetylene generator made of galvanized iron. The lower tank contains water; the upper section, which carries the carbide, as it proceeds into the water assumes a bell

the outside tank, the gas itself proceeding to the operator's torch. Thus a gasometer is entirely unnecessary.

Cleansing the Acetylene.

The gas in its course passes through the supply of carbide, relieving itself of all water; then through a wool-dust arrester, which takes away the amorphous lime powder. It then proceeds to the torch by way of the hydraulic backpressure valve. This piece of apparatus is used to prevent gas from striking back through the torch to the generator and consists of a water seal. In the centre of Fig. 1 is the oxygen bottle, with pressure regulator and indicator.

Here, then, are the two sources of gas—the acetylene and the oxygen. They proceed along separate tubes to the torch. Oxygen costs three cents a foot, and acetylene approximately one cent. Fifteen feet of acetylene is used to ten of oxygen when using a certain blow-pipe. Roughly, the mixture is two to one.

So that a layman can easily figure out how much oxygen he should use. He gets 450 ft. of gas from every 100 lb. drum of carbide, costing \$3.75. The Siche Gas Co. use one drum per week, and they are using the torch continuously.

Charging the Generator.

The acetylene generator operates automatically. When the operator

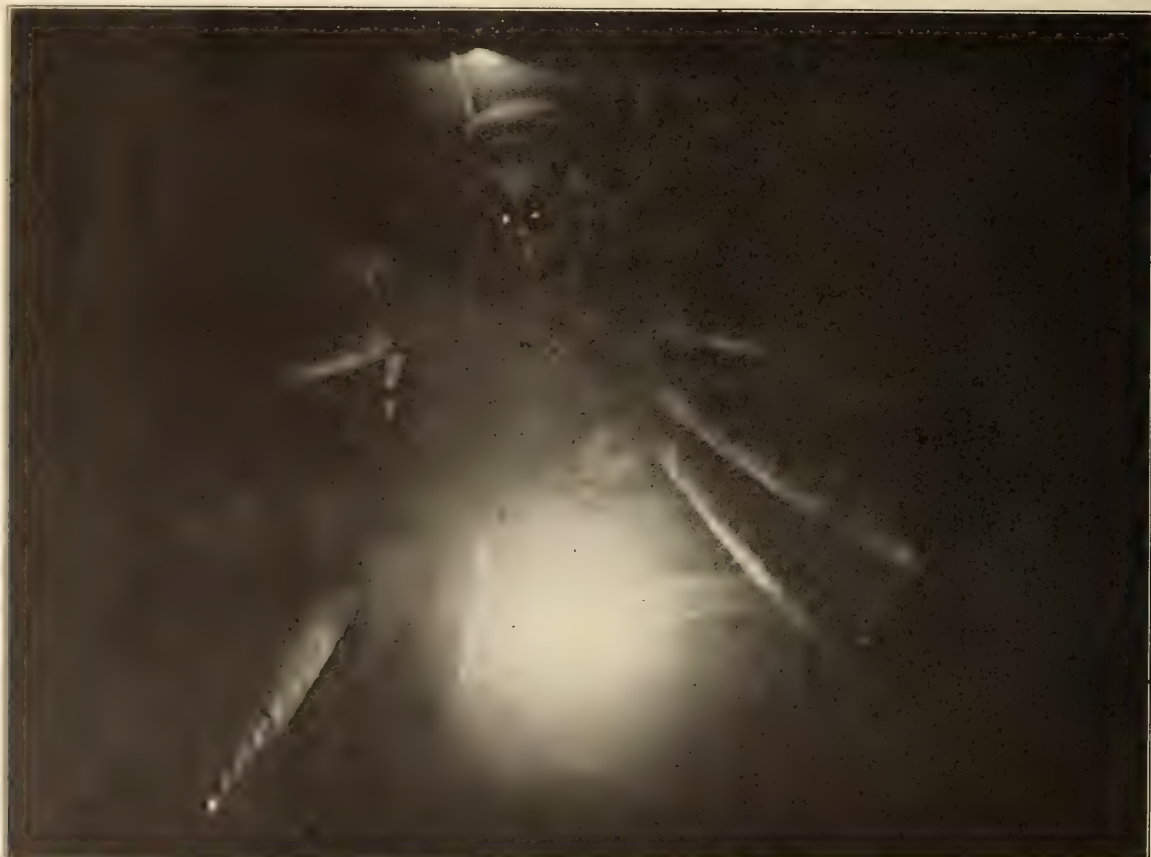


Fig. 2 B.—Closer view of cutting 6-inch shaft—Courtesy of the Siche Gas Co., Toronto.

is one of many made in America, but it is that of one of the pioneers in the business, namely the Siche Gas Co., Ltd., Toronto.

Simplicity in construction is one of the keynotes as will rapidly be seen by glancing at Fig. 1.

shape, the edges of which nearly touch the side of the tank. When the gas is being used, a float in the dome-shaped chamber operates a check valve, allowing the carbide to fall in small quantities into the water. The gas is generated, and forces the water upwards in



Operating inside the boiler, filling the fracture—Courtesy of the Siche Gas Co., Toronto.



Fig. 3.—Preparing to repair a boiler fracture—Courtesy of the Siche Gas Co., Toronto.

ceases to use his torch, the float closes the check valve, and no more gas is generated. Should the supply carbide run out while work is proceeding the dome can be refilled without any risk. When the plug is removed from the top of the dome the check valve closes, preventing the escape of gas. The water in the tank should be renewed, and the apparatus cleaned out once a week.

The cutting process is as follows: First the oxy-acetylene flame is turned on for a few moments until the metal begins to redden immediately opposite the point of the flame. Then a fine stream of pure oxygen is turned on, and quickly the metal oxidizes and is burned. The width of the cut is less than $\frac{1}{8}$ inch.

Making a Weld.

A weld in iron or steel plate is made by applying this flame to the edges of the parts to be joined, and by adding fused wire as the metal is reduced to a molten state. Welds hitherto were made mechanically in a blacksmith's forge, which limited the use of the weld. By the new process a broken piece, say the lug of a casting, or a crack in a boiler plate, or the fracture of an expensive brass vase may be repaired with the least possible trouble and expense.

Learning to operate Torch.

It usually takes a month or more for a man to be moderately expert with

the blow pipes. Operators are scarce and for the man who is willing to branch out as a specialist, there is excellent opportunity. To obtain recruits

several of the larger manufacturers are now taking men into training.

Requirements of an Operator.

The operator must have a fair knowledge of the expansion and contraction of metals. Ironworkers of all kinds readily adapt themselves to the process. Smoked goggles are worn to shield the eyes from the fierce light of the acetylene and asbestos mitts and apron to ward off heat. The principal thing is to learn to save oxygen and acetylene by carefully pre-heating the work and cooling it slowly after welding. The latter operation is effected by packing the work in asbestos tanks. The process of cutting is very much simpler than that of welding and to become moderately proficient at it requires only a short term of practice.

Users for S. & H. Engineers.

As yet, the oxy-acetylene torch has not been made use of to any great extent in the trade of the sanitary and heating engineer. It has been stated that the torch can be used to advantage for tearing down buildings or for cutting through cement floors and walls in order to connect up pipes from one building to another, and that a thick cement wall or floor can be cut through in a very few seconds. This, however, is a point on which manufacturers and operators disagree widely. All claim that were the wall reinforced by structural steel, the torch could be used to advantage for cutting through the steel, after the ce-

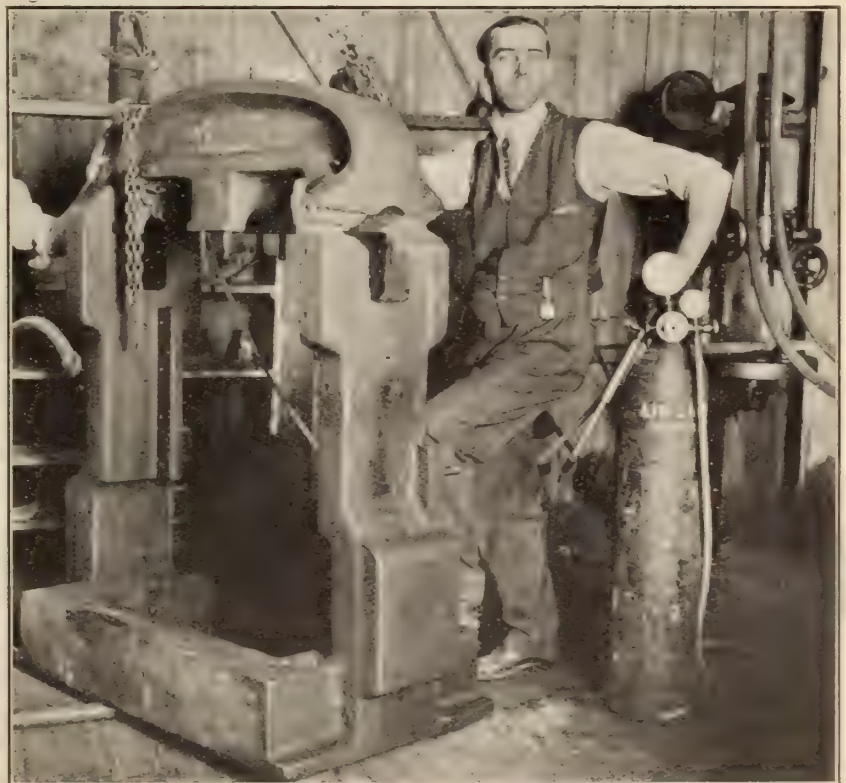


Fig. 4.—Saving the frame of a one-ton Bliss Press — Courtesy of the Siche Gas Co., Toronto.

ment had been pierced by the old method of chisel and hammer; but to attempt to cut the cement itself some claim to be a very dangerous process. An operator in the Carter Welding Co., Toronto, claims that only recently he almost lost his eyesight through attempting to cut a piece of steel plate on a concrete floor. The action of the torch resulted in the chipping of the concrete, and caused the chips to fly up into the operator's face. As he was without goggles, his position immediately became dangerous.

Many other suggestions have been made with regard to a sanitarian's use of the torch, and with more or less practicability. It is claimed that the torch could be used to great advantage for closing up sand holes in pipes, found only upon application of a smoke or water test, and thus get over the difficulty and annoyance of tearing out part of the installation. By taking the torch on the job, in a few minutes this hole could be closed up.

Another suggestion is that the torch be used in laying soil pipe, or in setting up a soil pipe stack. In this case, molten metal could be flowed right into the joints and thus improve the work from the time standpoint over the now prevalent caulking process.

These and many others. But just how

far the sanitarian could use the torch has not yet been proved.

Heating engineers might make much more use of it in connection with boiler sections and plates, but up to present time its use has been confined largely to trade of machinists. There is little doubt, however, that in a very short time this process now only introduced will become one of the most valuable to all metal workers.

Size and Weight of Apparatus.

Oxy-acetylene plants can be obtained in almost any size and weight desired. Many so-called portable plants are made, but most of these are such as would require a delivery wagon to move from place to place. At any rate it must not be concluded that a plant can be picked up as a plumber's kit and carried on the shoulder. To do extensive and satisfactory work a plant weighing two hundred pounds and upwards would be necessary. In brief, the plant may be considered about as portable as a portable gasoline engine, or probably a little more so.

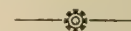
The Toronto Power Co. operate a portable cutting outfit which they use for work along their power line between Toronto and Niagara Falls.

Cost too varies very extensively, range being from \$60 to \$1,000 and upwards, depending greatly on size and accompanying equipment.

Examples of Work Done.

Fig. 3 illustrates a difficult piece of work done for the Consumers' Gas Co., Toronto. A fracture had formed over the fire box in one of the water tube boilers, and was leaking. In the ordinary course of events it would have been necessary to drill holes, rivet a plate over the defect and make it watertight. Using the oxy-acetylene method, a man was let down among the tubes, where he champfered out the fracture, which was 13 inches in length. Welding was done in about three hours, and when the boiler was tested next day the result was pronounced quite satisfactory.

Fig. 4 shows a 1-ton Bliss press which had been fractured at the point shown, fracture being $3\frac{1}{4}$ inches deep and 16 inches across. The repair work took about 14 hours, and the total cost was about \$50. Thus an expensive piece of machinery was saved with very small expenditure.

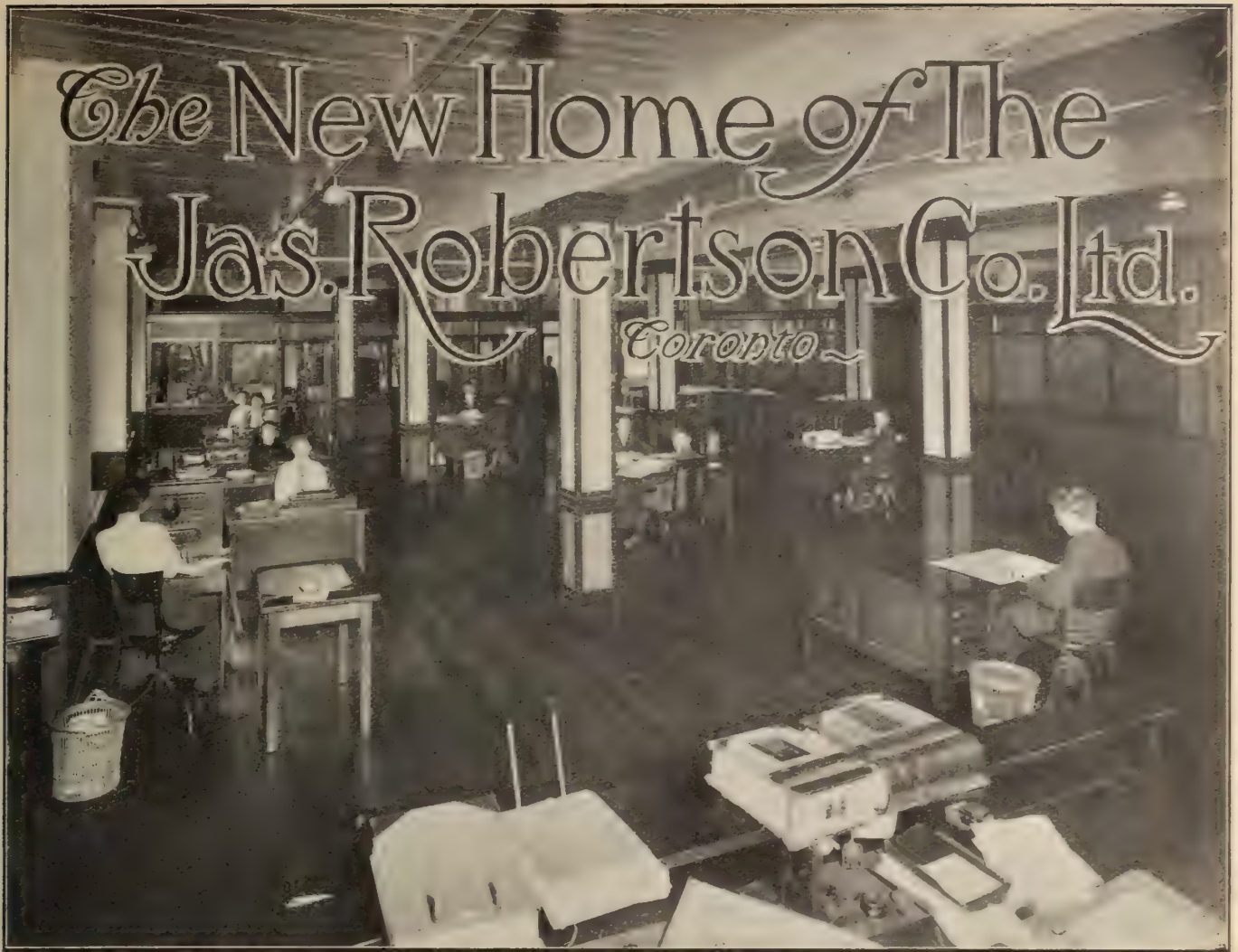


Moose Jaw, Sask.—Masters in this city have decided to tie up work rather than yield to the demands for increased wages made by local plumbers.

Calgary, Alta.—Plumbers here are asking for higher pay, and request that beginning June 1 they be given from 68 to 75 cents per hour.



Welding by the oxy-acetylene process—Courtesy of the Siche Gas Co., Toronto.



A Description of the Handsome and Well Equipped Office and Factory of the Company at Toronto—The Largest Showrooms in Canada are an Outstanding Feature—Splendid Manufacturing Facilities in the New Building.

The new home of the James Robertson Co., Ltd., on Spadina Ave. and Sullivan Street, Toronto, is an imposing building. It stands five stories and basement in height, with a wealth of plate glass front, through which can be seen an extensive showing of the latest and best in bathroom equipment. The passerby has a splendid view of the really magnificent stock, which is kept in the showroom, on the main floor, and instinctively stops to glance in at the goods on display.

It is now about a year since the move was made from the old building on King street west to the new home of the company. The King street site had been occupied since the inception of the company in 1857. When the necessity arose for expanding the plant to keep up with the rapidly growing business of the company, it was decided to locate in the Spadina district, which is becoming the best manufacturing and wholesale section of the city. Incidentally, it was decided to make the new plant and showroom models of their kind, an object which has been most effectually carried out as a visit to the building attests.

The front of the new building on the main floor is given over entirely to the showroom. As stated before, the front is practically one long expanse of

plate glass, which fills a double purpose; allowing the public to gain a view of the handsome stock on display and also admitting the maximum of light into the showroom.

Facing the entrance, which is placed in the centre of the building, is a wide mahogany stairway, leading up to the main offices on the second floor.

To the left of the entrance there is shown a complete line of the latest designs in enamelled iron, porcelain and vitreous china ware, consisting of bath tubs, lavatories and sinks. In this section is also shown samples of showers, including needle, non-scalding and sprays suitable for every use from the home to the gymnasium or modern club room.

To the right of the entrance is found a variety of closet combinations, including valve, low down and high tanks, together with laundry tubs, sinks and bath tubs.

The brass fittings shown on the showroom fixtures are mostly of their own manufacture, and represent both in quality of workmanship and design, the highest type of excellence to be found in these goods.

In addition, there is a very complete showing of bath room accessories, consisting of medicine cab-



A view of the showroom on the main floor to the right of the entrance. This section is devoted to sinks, and closets largely, although some tubs are also shown.

inets, mirrors, towel bars, soap trays, tumbler holders, etc., in nickel plated brass, china, glass, enamel and pyralin finishes.

The whole is finished in mahogany, with square pillars, which gives a most highly attractive appearance.

The showroom is the largest in Canada, and consequently the display of sanitary appliances on the floor is the most complete of its kind to be found.

THE DEMONSTRATION ROOM.

In the basement a demonstration room has been fitted up. Here all styles of closets are fitted up with flushometers and tanks, with all the latest improved fittings. These can be put under different pressures. In this way it is possible to demonstrate perfectly the working of each style of closet carried.

THE EXTENSIVE STOCK OF OFFICES.

On the second floor the offices are located. They are light and spacious, finished in mahogany and fitted with everything of the most modern order in office furnishings and business appliances.

THE MANUFACTURING PLANT.

A representative of The Sanitary Engineer was shown through the plant recently and a brief account of what was seen will be interesting. At the outset it may be explained that the building is of mill construction.

It is equipped with every appliance which meets the approval of the modern architect from basement to roof. There is a passenger elevator and four freight elevators. A complete sprinkling system has been installed on every floor and, as fire-proofing arrangements have been made complete, the risk from conflagration has been reduced to a minimum. Electric power is used and the plant is lighted by electricity throughout.

On the top storey is the department devoted to the manufacture of brass goods. The plant is equipped with most modern machinery for brass finishing and testing appliances and electro plating. The illustration presented gives an idea of the extensive nature of this department.

The floor below is devoted to the manufacture of tanks. A large staff is employed in turning out closet tanks of all sizes, shapes and descriptions. A portion of this floor is devoted to the storage of tanks and plumbers' earthenware.

The third floor is devoted to the storage of enamelware. An immense stock is carried, some sections of this floor being piled almost to the ceiling with stock.

The second floor, to the rear of the offices, is devoted to the storage of iron pipe fittings and brass goods. The stock, stored in the huge bins, would



A splendid view of the showroom to the left of the entrance. With the section to the right, this showroom is the largest in Canada.

seem almost sufficient to supply the whole sanitary craft for a lengthy period of time. But, as a matter of fact, the stock is turned very frequently.

The first floor, behind the showrooms, is used for shipping purposes.

THE MANUFACTURING PLANT.

The first in process of manufacture was the brass goods in the brass foundry. This building stands in the rear of main structure, and is equipped with 12 furnaces of force draft type, with a melting capacity of 2 tons per day, and employs furnace men, moulders and coremakers, over 20 in number. There are also several moulding machines, fitted up with compressed air, sprue cutting machines and water rumblers, all of a type to ensure quick handling and first class castings. These are then transferred to top floor, which is one of the most up-to-date brass finishing shops of its kind for the production of plumbing goods. The polishing room was then visited, and there was found the most up-to-date grinding, polishing and buffing machines all fitted up with exhaust hoods to a pipe line and fan to take away the brass grindings and dust. For a polishing room, it was a credit to the company, it being so free from dust.

The electro plating shop adjoins the polishing room, and is equipped with a 4,000 watt electro-plat-

ing dynamo, 3 large nickel plating tanks with all other necessary solution vats.

The lead pipe presses are located in the basement, here is carried on the manufacture of lead pipe, block tin, wire solder and pig lead.

South of the main building and separated from it by a paved driveway is an iron pipe shed, in which is carried a large stock of pipe. This department is located in a separate building to facilitate shipping.

ADVANCE IN THE CRAFT DEMONSTRATED.

Altogether, a visit to the new plant of the Jas. Robertson Co., Limited, demonstrates in the most striking manner possible the advances which have been made in the sanitary craft. The stock on display in the showroom, which includes models both perfect in operation and beautiful in their lines and snow-white composition, is a striking proof of the high level of perfection to which the manufacture of sanitary fixtures has been brought.

The new building is, likewise, the most striking proof of the excellence of the goods sold by the James Robertson Co., and the satisfactory nature of the service they offer. It tells eloquently of the growth which has come to this enterprising concern, and as a convincing evidence of their conception of present possibilities, it bespeaks the increased growth of the company's business in the future.

(adv't.)



A good view of the exterior of the handsome new building of the Jas. Robertson Co., Ltd., at Toronto. Note the open construction on the ground floor, giving an unobstructed view of handsome showrooms.



A view of the machine shop on top floor, where the brass fittings are finished.

Should Main House Trap be Installed

R. J. Thomas, Lecturer on Plumbing in Winnipeg Technical School Presents Arguments for and Against its Installation—Concludes that Trap Should be Abolished Except in Cold Climates—Advocates Ventilating of Sewer Where Trap is Installed.

Ever since the Convention of Western Plumbing Inspectors and Sanitary Engineers, which resulted in the complete ruling out of the main house trap from all installations, the question of a main house trap has been one of the foremost before the minds of all sanitarians, throughout the province.

At the convention R. J. Thomas, Lecturer on Plumbing in the Technical School, Winnipeg, Man., dealt in a scholarly way with the different arguments for and against the main house trap. His final decision is that the trap should be abolished except in countries which are subject to extremely cold weather. The arguments which he brings forth in arriving at this conclusion, are given below in the form presented in Winnipeg, before the convention.

Arguments for Main House Trap.

The chief argument advanced in favor of the house-trap is that it prevents the ventilation of the sewer through the house drain and soil pipe. This argument assumes that sewer air is more dangerous to health than drain air. The consensus of opinions of the best authorities is that sewer air is incapable of carrying or imparting any specific disease. Perhaps the statement might be made stronger by the fact that there is no instance on record of any specific disease germ having been found in sewer air. The fact that workmen frequently spend much of their time in sewers with impunity, or work upon or about sewage, in sewage purification works or on sewage farms, seems to show that experience does not confirm the idea that the gases emanating from sewage are always or necessarily dangerous. Some authorities claim that drain air is more injurious than sewer air, since the vertical soil pipe, on account of the spraying action of falling water, becomes fouler and is more difficult to clean than almost any other part of a sewage system. Often, however, the most objectionable ingredients of sewer air are those derived from illuminating gas entering the sewer from leaks in the gas mains.

It has been stated that the passage of rats from the sewer to the house drain is prevented by the use of the trap. This would be a decided advantage in the case of plague, but the argument is worthless since rats have been

observed to pass through the trap in both directions.

Another contention is that the seals of fixture traps are not affected by variations in pressure occurring in the sewers. This does not apply where the fixture traps are properly vented and the vents are clear.

Lessens Freezing of Roof Terminals.

One point which might be considered in favor of the house trap in Western Canada, is that the danger of roof terminals freezing over is lessened, owing to drain air containing less moisture than sewer air. This deserves some consideration as the problem of keeping vent terminals open during extremely cold weather has not been solved.

It is also claimed that the house trap prevents foreign bodies from entering the sewer. This does not seem to be a point in favor of the trap as any article which passes through the trap will cause a stoppage in the sewer.

Arguments Against Main House Trap.

The arguments against the use of the trap seem to be substantial and are as follows:

The use of the trap involves separate ventilation of the house drain and this necessitates the provision of a fresh air inlet. This pipe is often the source of trouble as it frequently acts as an outlet for foul air, especially when water closets within the building are discharged. In some instances it is the means of freezing the water in the trap during cold weather. For these two reasons the fresh air pipe is often plugged intentionally and is of no further use. Then the outer end of the pipe also becomes plugged with snow, and earth in many cases. Great difficulty is often experienced in placing the pipe where it will not cause a nuisance.

Installing the trap and fresh air inlet increases the cost of the plumbing. This argument, however, is not entitled to much weight against sanitary considerations.

Causes Sediment Deposits.

The trap forms an impediment to the flow of sewage and decreases its velocity, allowing deposits to gather in the house drains.

Obstruction of Trap Unavoidable.

The trap itself often becomes obstructed. According to the report of the British committee, which has been investigating the relative advantages of the house trap for the past five years,

the trap has a tendency to retain from 42 to 79 per cent. of the solid matter passing through at any given time. They claim that this objection may be diminished to a great extent by using a trap of smaller diameter than is customary at present. The liability of the trap to become blocked appears, however, to be insuperable; and it is this liability which constitutes its most serious disadvantage. The accumulation of sewage in the drain produced by the stoppage, may not be discovered until it has overflowed the basement floor at the floor drain, and in the meantime it has backed up in the weeping drains and left deposits under the floor, from whence it is practically impossible to remove them and they will be the cause of continual nuisance.

According to the report quoted above, this unsuspected blocking of the trap and the accumulation of the sewage appear to be very common, evidence of it having been found in more than 23 per cent. of 5,600 traps which were specially examined.

Direct ventilation is provided for the sewers through the soil pipes. Assuming that sewer air is not more injurious than drain air this seems to be the best and most efficient method of adequately ventilating the sewers.

Omission Allows Better Sewer Ventilation.

Should there be any illuminating gas present in the sewers, there is less danger of it entering buildings or collecting in confined spaces as the omission of the trap gives a better general ventilation of the sewers.

Sewer air contains more moisture than drain air, consequently, there is less danger of evaporation from fixture traps than when the house trap is used.

Tested both Ways in Winnipeg.

In Winnipeg, during the past seven years, the installation of the house trap has been optional and since the new plumbing by-law came into effect three years ago, the majority of systems have been installed without the trap. This has been the means of lowering the temperature of the sewer air during the winter to such an extent that many sewers and untrapped sewer connections have been frozen. From January, 1912, to March, 1913, 129 frozen sewer connections were reported to the City Engineer, and there were probably as many more frozen which were not

reported. During the same period 75 main sewers were frozen, some of them measuring 2 feet 6 inches in diameter and ranging in depth from 8 feet to 25 feet below the street level. In the case of sewer connections the ones which became frozen were those nearest to the manholes, although in some instances they were connected at a distance of

60 feet away. The freezing of these pipes became such a serious matter that an amendment to the plumbing by-law was passed by the City Council recently, making it compulsory to instal house traps on all new plumbing systems, after March 1st. 1913.

Abolish Trap Except in Cold Climates.

After considering the various argu-

ments for and against the trap, I am of the opinion that it should be abolished except in countries which are subject to extremely cold weather, and in mild climates where the trap has been made compulsory a vent pipe should be installed between the trap and the sewer in order to ventilate the sewer connection.

Terminals Adapted to Western Conditions

W. McFarlane, Winnipeg, Discusses the Three Kinds of Pipe Terminals and Points Out the Methods of Installation—Proved Most Satisfactory to Climatic Conditions and Sanitation in Western Canada—Peculiar Style of Casing for Roof Terminal to Prevent Freezing.

In submitting the following remarks on the question of pipe terminals before the Association, I propose to deal with them in the order and rotation that a plumber deals with them when called upon to instal plumbing in a building. And the first terminal we shall touch upon is the outlet end of the soil pipe where it terminates at the connection to the tile sewer.

At one time it was, and if I mistake not, it is still the practice in some towns, to carry the tile sewer through the cellar to within three feet of the stack, but this has been to a large extent done away with, and rightly so, the iron pipe now being carried through basement and terminating outside the external wall, the distance from the building to point of connection with tile sewer varying in different localities. In our city under the old by-law, the distance called for was 3 feet from wall of building, but owing to complaints of bad odours, which were found on examination to emanate from this connection which had got broken, through settlement of the building or other cause, when the new by-law was under discussion it was decided to extend this distance to 8 feet from wall to point of connection. This, in my opinion, is a fairly safe distance.

Extend Soil Pipe Clear of Building Line.

While dwelling upon this part there are two points I would just like to call your attention to, the first point being: would it not be advisable to have the soil pipe extended to about 6 or 8 feet clear of building line? In a growing city such as we have here in Winnipeg, and I suppose the same can be said of nearly every city in Canada, we find a change going on. What is residential property to-day, becomes part of a business section in the course of a few years, with the result that we have owners, in trying to keep pace

with the progressive movement, building small stores in front of their residence, the same being invariably placed on top of tile sewer, which is a contravention of city by-law and therefore causes considerable annoyance in getting the matter rectified, as the contravention is not generally known until the building has been nearly, if not altogether completed, and therefore entails quite a bit of expense, not to speak of ill-feeling, before it is put in order. Of course if it could be determined what is likely to remain residential property it might be possible to differentiate between the two, but as it is almost an impossibility to do so, then I think it should be made a rule to have the soil pipe extended clear of the building line.

Terminate Party Sewer at Sidewalk.

The second point I would call your attention to, is, the question of party sewers. At present we have a party sewer carried up between two lots and then branching off sometimes in front of and at other times between the houses into the individual basements, consequently when one of the owners decides to build an extension, which is sometimes placed over this sewer, it causes quite a bit of trouble to have it rectified. One instance like this came under my notice last summer, when the party making the alteration, cut off the sewer entirely from his neighbour, who happened at the time to be out of the city for three months, having let his house in the meantime to a friend and it was only by threatening the party in the first instance, that we got the matter put right. In my opinion this should be altered so that the party sewer should terminate at side-walk and each individual sewer taken in through the frontage of the lot it is proposed to serve.

Roof Terminals.

The second terminal we shall consider is the roof terminal of soil, waste,

and vent pipes. In the early days of plumbing we find that the question of the position of these terminals was more or less determined by the position of the water closet or other fixture which the pipe was intended to serve, the pipe being brought up that length and the fixture bedded on or fastened to the pipe in various ways. It certainly saved quite a bit of worry and expense in the initial installation of the plumbing, but what was incurred through sickness and other ways more than made up for the extra expense required to make a sweet and wholesome system of plumbing such as we have to a more or less extent to-day. However, with the advance of time and the development of the science and art of plumbing it was found that this old method of doing things must be done away with and that to have a system of plumbing as near perfection as possible, you must have a proper circulation of air through same, thereby clearing out offensive odors and making it as fresh and sweet as possible. To have this done it was necessary to have these extended above the roof, which at first was done indiscriminately, the pipes being merely extended above the eaves or roof line, without any attention being paid regarding its close proximity to windows or other openings, which led ultimately to many cases of sickness being traced to this cause. To remedy this it was found necessary to have these extended either above or away from any opening, the minimum distances varying in different localities. In our own city the by-law requires these to be at least 2 feet above or 10 feet away from any window or opening of its own or adjoining property, which in plumbing practice seems to be a fairly safe distance. However, sometimes we find that a house is built close to the lot line, with the soil pipe immediately inside the external wall. No building

being on the adjoining lot this fully complies with the by-law. After a time a house or block is built on this empty lot, having a window within 4 or 5 feet of this terminal, a point not observed until the building is sometimes near completion, thereby causing not only annoyance and expense, but sometimes spoiling the symmetry of the building before the matter is put right.

Terminal at Least 10 Feet from Lot Line.

To remove this difficulty I would suggest that some rule be adopted whereby the terminal on flat or low pitched roofs be kept say, at least 10 feet from the lot line and in case of a high-pitched roof, the pipe to be extended up inside the building and carried through the roof, close to the peak or at least 10 feet from lot line.

Roof Cap Found Most Satisfactory.

Having considered the position let us now turn to the manner of dealing with the terminal by way of providing a roof cap or casing for same, and this is a part which I think could hardly be embodied in a standard code as, owing to the variation in climate, one can easily understand that what is necessary for Winnipeg and district, may not be required at the coast where it is so much milder in winter, and therefore should be left to the different localities to deal with according to the necessity of each district. Five years ago the roof cap in common use was a sheet metal casing slipping over the 4-inch pipe with a loose covering cap to make it weather-tight. This was very unsatisfactory, complaints reaching the office regarding bad odors owing to this pipe being frozen. In some cases it was found filled with ice down to roof level, with the result that traps were syphoned and drain air had free access to building. It was obvious that some plan had to be formed to remedy this, so, when specifications were prepared for the installation of plumbing by the city, an experiment was tried, wherein this casing was made 2 inches larger in diameter than the soil pipe, giving a 1 inch air space between casing and pipe, which seemed to relieve it a little, but it still was far from satisfactory. So, in framing the new by-laws three years ago, this same idea was enlarged upon, whereby the soil pipe was increased from 4 to 6 inches, terminating with a hub, and a double casing made, the inside casing 2 inches larger in diameter than the soil pipe and the outer casing 2 inches larger in diameter than the inner casing, the space between the casings being packed with hair felt or mineral wool and the whole surmounted with a cap caulked into the hub of the soil pipe. This, while not the unmitigated success we would like to have seen, yet on the

whole is fairly satisfactory. In fact, where the plumber has been careful in having the casing level with the hub, the outer space properly packed and the covering cap resting on top of the hub, we find that even in the coldest weather there is very little, if any, frost inside the pipe. Complaints about pipes being frozen are often, but not always, traced to the above precautions not being carefully attended to.

Eliminate Number of Terminals.

A point that I think ought to be rigidly adhered to in this connection is, that there should be as few pipes as possible carried through the roof. In an ordinary dwelling, if practicable, only the 4 inch soil stack should be carried through, and all vents be re-connected to stack before passing through roof. In blocks the individual stacks only should be extended through, and all vents from branches off that stack should be re-connected to same before passing through roof. There is one difficulty which still confronts us here and for which a remedy has yet to be found, and that is, how to keep the top of the roof cap free from a formation of honeycombed ice which, in the very coldest of the weather builds up on the roof cap, sometimes rising to a height of 2 feet or so above the cap. This funnel or pipe of ice, will sometimes curve over at top according to the direction of the wind and close up the aperture and thereby cause traps to be syphoned. Various remedies have been suggested which are more or less in the experimental stage, but as yet none have been proved to be adequate in solving the difficulty.

Fresh Air Pipe Terminal.

The third and last terminal to be considered and which I shall just touch upon, is the terminal of the fresh air pipe. At one time a hole was cut through the external wall at a point near to the upright pipe in basement, the pipe put through and a cap bolted to the end of the pipe, but through this terminal being sometimes in close proximity to windows or immediately under verandahs, it thereby caused considerable annoyance and discomfort to the inmates of the house owing to bad odors emanating from same when the water closet was flushed. To remedy this, it was decided to have this terminal placed at least 6 feet away from all windows or openings where practicable and instead of the cap the pipe to be finished off with a return bend which I think is a fair solution of the difficulty.

MADE HIS MONEY IN PLUMBING.

In the course of a series of sketches of prominent local citizens, the Sault Ste. Marie Star says of J. W. Thompson, hardwareman: Our subject is the

oldest son of Chas. A. Thompson. Possessing the restless pioneer spirit of his grandfather, he left Michigan at the age of twenty-six and set forth in search of newer fields.

During his first year's residence in the Soo he was appointed chief constable of the township of Korah, a portion of which is now Steelton, and at the same time worked on the construction of the new railroad. He had some exciting experiences as an officer during those early days when bad men were plentiful. After his railroad experiences, and up to four years ago, he worked at various occupations. Though



J. W. Thompson.

the village wise-acres tried to point out his foolishness for going into it, he opened a small pipe-fitting and plumbing establishment, just across the street from his present location in Steelton. The venture proved him a typical level-headed Scot. The undertaking has grown into a substantial business that has amply justified his early determination of mind, and will continue to do so more and more as time progresses.

Up to a year ago he handled only pipe fitters' and plumbers' supplies, individually contracting and doing this class of work himself, but the rapidly increasing demands of the ever-increasing population of Steelton for diversified hardware finally decided him to venture a move to larger quarters, and control a general stock of hardware. Last January he moved to the large, brick, business block he now occupies, and with a complete stock of hardware and builders' supplies, opened his place to the buying public.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

ILLUSTRATION OF WHAT REAMING DOES.

Editor of the Sanitary Engineer.—I see a good deal in your paper sometimes about reaming the pipe, yet never in all the work I have done have I performed this operation. I guess that it is all, more or less, bunk and that the



Fig. 1.

pipes will deliver the goods anyway.—X

The pipes may deliver the goods, at least a portion of them, but not to the extent that the pipe will when reamed. Examine the cuts shown by figure 1 and you will be convinced that a reamed pipe will deliver a greater quantity of water than one not so treated. An unreamed pipe will sometimes create a noise which is unpleasant.—D.C.H.

HOW ABOUT THE 10 PER CENT. OF "OVERHEAD" EXPENSES.

Editor of the Sanitary Engineer.—From time to time I have noticed observations in the paper about that item, the overhead expense and wonder that the men in the business do not tend closer to their knitting. I have been able to skin this item down to less than 20 per cent., and if you have any information to the contrary that is reliable, I, for one, should be mighty glad to hear it published.—D.C.H.

Occasionally we have listed to some one in the business who claimed that he was able to make the "overhead" on 10 per cent., but when we began to list up things we found that there were many things that he (in truest plumbing style) had not "figured on." If you can make it on 20 per cent. consider yourself lucky, for there are many in the business who can't make it on 25 per cent.—D.C.H.

CONNECTING GAS HEATER TO RANGE BOILER.

Editor of the Sanitary Engineer.—Kindly tell me how to connect a gas heater to the range boiler so as to get

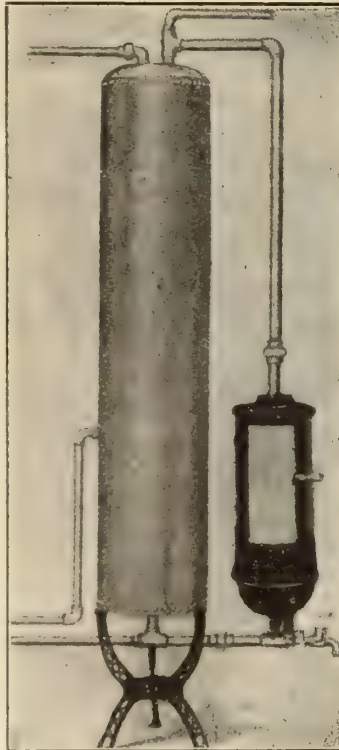


Fig. 2.

good results.—J. J. Cunningham.

In fig 2 we publish a cut of how the connections can be made and success result.—D.C.H.

WHERE SHALL THE BASEMENT WATER BE DRAINED?

Editor of the Sanitary Engineer.—Would it be proper to drain any water that might accumulate in a basement into the plumbing system of the house? If so what would be a good manner in which to perform the operation?

X.Y.Z.

If the levels are right with respect to each other, the basement water might

be drained into the sewer if the law allows it, but a back water tap should be used. If the cellar is so low that drainage cannot be affected by gravity some first class automatic cellar drainer can be installed that will elevate the cellar water to the required level. A trapped and vented sink should be connected to the sewer system and into the sink the cellar water should be drained. This will give perfect safety from all gasses that might come from the sewer system.—D.C.H.

CLEANING OUT DIRTY PIPE THREADS.

Editor of the Sanitary Engineer.—Will you be kind enough to tell me of some practical manner of quickly cleaning up for use a lot of pipe threads where one does not desire to change the dies in the stocks every time one has a different size of pipe?—Practical.

Where the threads are jammed out of shape the omission of recutting the threads is apt to produce serious leaks and one had better take the time to cut over the threads than to have to pull the pipe and make good the leaks; but where the threads are merely full of greasy dirt or dried on paint the writer has very often made use of the following expedient: Select a plain pipe coupling that has an easy thread and plug the end that you are not going to use in catching. The object in plugging is so that the coupling shall not be sprung out of true by pinching with the pipe wrench. You then have a loose, plain pipe coupling that will catch on any thread of its size and can run it well up on all the threads that need cleaning. As previously stated do not try the coupling deal on badly jammed threads.—D.C.H.

SPlicing IN WATER PIPE IN A DITCH.

Editor of the Sanitary Engineer.—When it is desired to make a cut in a one or two inch pipe and splice in an additional line for water supply, will

you please tell me an easy practical manner of doing the job without taking up too much of the pipe.—Thos. E. Williams.

It will not be necessary to dig the ditch longer than five feet, but it will be more convenient if it be dug about a foot wider than is usual. It will give freer play for the wrenches and stocks. Cut out enough pipe to allow for all the fittings that are to be injected into the line. On one of the ends of the buried pipe cut a running thread and put on a lock nut. You can make up all of the fittings and make the last connection with a coupling—the same can be run far on to the pipe and then loosened as you bring the union together. This work, of course, assumes that the pipe is practically immovable and that you do not want to dig up enough to give you a spring, sideways, on the pipe which would accomplish the same purpose as the running thread. The last thing to do is to pack and set down the lock nut and the job will be ready to run the branch pipe.—D.C.H.

RANGE BOILER GETS TOO HOT.

Editor of the Sanitary Engineer.—The range boiler in a certain house that I have work to do in, gets too hot and there does not seem to be any easy way to correct the matter. Will you please suggest some good way of doing it?—F.G.

Probably the easiest manner in which you can get good results would be to reduce the heating capacity of the water front, and the easiest way to do that would be to plaster some fire clay over the water front (or back as the case may be). Of course it would be possible to use a smaller water front. There is yet another way and that would be to sink the range boiler, say one third lower than it now is. As this would involve another stand and also different pipe connections, either of the two foregoing methods would in our opinion be more desirable, the fire clay especially involving very little trouble and its results being very positive as we have known many cases of this kind.—D.C.H.

SELECTING THE STEAM BOILER.

Editor of the Sanitary Engineer.—In picking out a steam boiler for house heating would it be better to get one that had a small water supply, and was a quick steamer, or to take one that had more water in it and did not make the steam quite so quickly?—Reader.

We believe that in most cases we should prefer to take the slower boiler. A boiler that has a large storage of water is one that you can put a banked

fire under, and the boiler will run quietly for from twelve to eighteen hours, maintaining an even steam pressure of from a quarter to half pound of steam. In that same time it would probably have been necessary to have put fuel on the quick steaming boiler anywhere from three to six times or more. Comparing these two boilers doing as nearly as can be the same amount of work on two houses approximately the same; the large storage and slow steaming boiler will burn easily one quarter less fuel day by day.—

D.C.H.

SIMPLICITY IN A SHOW ROOM.

Editor of the Sanitary Engineer.—Is it a good plan to have the show room plentifully supplied with the different kinds of fixtures that pertain to the business?—K.

We believe that there is a limit and that that limit is reached when the fixtures are so numerous that the customer becomes confused and is unable to come to any decision. In figure 3 we show a room that strikes us as being

other, or be eaten," there will always be a certain amount of hostility between people who are in the same line of trade. All preaching to the contrary, and all of this dope about the "olive branches" doesn't seem to get favorable results. If you approach any of your competitors in the spirit of humility and of settling things for the sake of having peace, we are very much afraid that you will be laughed at and will have had your trouble for your pains. There is an angle, however, from which you are justly entitled to approach any of them and to secure their attention; and that angle is SELF INTEREST. If you can show them that it is to their interest not to sell goods at cost and to do work too cheaply, and where it would be far better to let work slide rather than do it at a loss, you might stand some show of bringing about a respectable manner of doing business. To get at things there is no better way than to get at the amount of business done and the profit that there would have been on the gross amount. Then find out just what the profit really was, and if



Fig. 3.

strong on elegance and arrangement without having too much to confuse the customer and distract the mind from the main idea, which should be to purchase a bath room.—D.C.H.

CO-OPERATION AMONG SANITARIANS.

Editor of the Sanitary Engineer.—There are three other shops in the town in which I live and we are all on just speaking terms. As to any uniformity in prices why is it not to be thought of. Does this same feeling extend to all parts of the country? What can I do to start something in my town that will bring us closer together?—Unity.

As long as general spirit in business continues to be "Let one dog eat the

you don't have a telling argument right at your tongues end we are mistaken. There are few rich plumbers, and one reason for the fact is that they never can unite for the interest of the business.—D.C.H.

CEMENT UNDER WATER.

Editor of the Sanitary Engineer.—Will you be kind enough to tell me if it is true that Portland cement will harden while under water?—Helper.

The common Portland cement will harden while under water and will not then be affected by the waters action. Your information on the subject was correct.—D.C.H.

Setting and Connecting Range Boilers

By PHOENIX

CHAPTER I.

Thousands of articles have been written on the subject of the range boiler and the manner in which its connections should be made and yet, to-day, there seem to be fully as many mistakes made, just as many uncalled for blunders committed as in the times long since past. A curious feature in the matter is that most every one attributes the short-comings to the range boiler itself. "That boiler is no good, it won't heat the water quick enough." One hears such an expression nearly every day. Why not say, "the plumber was so blamed ignorant, or careless that he did not set up the boiler correctly?" Put the blame where it belongs, on the man who planned out the work. Any reputable range boiler if set up and connected properly will do its work right.

Galvanized iron range boilers are most commonly used to-day and those for house use vary in size from 30 to 60 gallons. The most common size is the 40 gallon tank, set in an out-of-the-way corner in the kitchen. If heat is wanted in the bath room and there is no other manner of getting it, the range boiler may be set in the bath room, even tho' said bath room be 100 feet distant. Again, if the kitchen room be limited, the boiler may be dropped to the basement, but such an installation does not always give the best results simply because the plumber does not always know how to locate the boiler with respect to the stove. The closer connections that can be made between the range boiler and the water back, when both are on the same floor, the better will it be for the job. Have as few turns and crooks as possible and ream all the pipes. To-day, galvanized iron pipe has taken, to a large extent, the place of lead for this purpose.

It has been found that it does not pay to use too small pipe for connecting the range boiler and the water front; $\frac{3}{4}$ inch being the smallest practical size. This will sometimes become stopped up by certain deposits which can be prevented entirely, if some water softener is used on the job.

After a great deal of study, some time since, I had the drawing shown by figure 1 drawn for another purpose, and it proved so successful that it will be made use of in this case for the articles. It "hunches" a whole lot of things that are to be told about this

subject. A water back out of level is shown by the figures "23, 7, and 6." A trapped water front or back will cause trouble, therefore put your level on it and see that it is "O.K." Take the line "7, 18," and also the line "6, 21," anyone knows that these connecting pipes between the boiler and the water front should never be trapped; yet day after day we constantly come across jobs where the careless plumber has turned this very trick. Again I

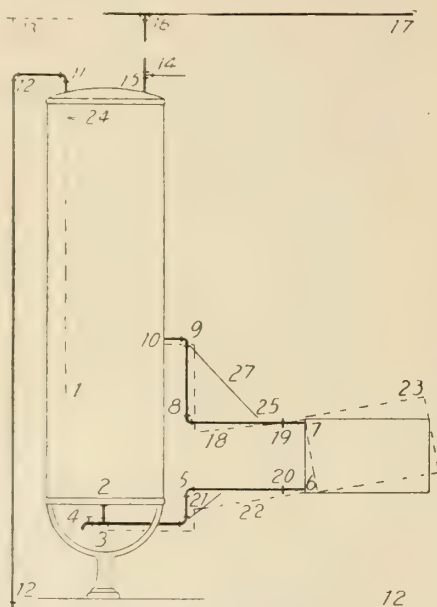


Fig. 1.—The range boiler and its connections.

say use the level. If the boiler was the last fixture on the cold water line, as is sometimes the case, the cold water might be connected as shown by "12, 12, 12." Notice the cold water drop pipe, "11, 1," inside of the boiler. More than half the plumbers make this pipe too long. It should be cut so that the lower end is slightly above the level of the water front, as shown here. The front can then never be siphoned. At "24" a small hole is punched in this pipe. Sometimes the hole at point "24" gets stopped up, and with an attic tank job a pocket of air will form in the top of the range boiler. When your boiler hammers and you have looked over all conceivable points, look here especially if it is an old job with tank in attic. All these things that I am saying are things that have happened in my own experience. This hole at "24" is left for the purpose of preventing the boiler

from siphoning. In case the cold water pipe is run too long and the end of it is below the level of the water front one can see how the water front could be drained. A vacuum valve can be used on the piping in order to make sure that there will be no siphoning.

The action of a vacuum is not understood by all plumbers. It breaks the siphon as would a siphon be broken if air were let in at the highest point. The action of the siphon valve stops the range boilers siphoning. Just the moment a vacuum is made on the inner side of said valve the pressure of the atmosphere opens the valve and air is admitted and the siphoning stops. The pressure of the water from the inside is what keeps the valve shut on all ordinary occasions.

Many times a check valve is used for the purpose of preventing siphoning. It should not be put on at all, for it prevents the expansion of the water and literally seals up the whole system, which is a dangerous thing to do, and frequently results in range boiler explosions.

In the drawing shown by figure 1, the lines represented by "7, 19, 8, 9, 10" and "6, 20, 5, 3, 4, and 2" will be found to show the ordinary manner of "hooking up" the water front and range boiler. The circulation of the water through the front and boiler is too well known to enlarge upon; the ease with which this circulation moves does not depend upon the size of either the boiler or the front, but does depend upon the size of the connecting pipes and their freedom from all stoppages. A large boiler with a small water front may have an excellent circulation and yet the water in the boiler be not very hot, because the boiler is too big for the front. This would be very true if the water was drawn quite frequently from the hot water faucets.

Putting a 100 gallon boiler in connection with the ordinary water front generally results in having a large supply of lukewarm water that seldom gets hot. Where the occasion demands a boiler of that capacity some additional means of heating had better be provided; such as connecting two fronts to the boiler, or installing a tank heater in the cellar. I want to call attention to line "14" connecting to the tee at point "15." Some plumbers abandon the side connection at "10," plugging

(Continued on page 34.)

Association Should Build for the Future

Necessity of Early Laying a Solid Foundation for Society—Sanitation Only a Recent Development—Cooperation With Other Societies Beneficial.

"Looking Ahead," the topic of the following paper written by H. De Jeannis, chairman of the committee on Research of the American Society of Inspectors of Plumbing and Sanitary Engineers, shows the light in which this sanitarian views the present state of trade perfection as compared with developments likely to take place in the future. The paper, read at the Western organizing convention recently held in Winnipeg, advocates strongly the laying of a sound foundation with every consideration for future association and scientific development, and is given in full as follows:—

Looking Ahead.

I do not know why I choose this title more than any other, except it be for the fact that prophesy always opens up some way of escape for the prophet. When one deals with matters which are a matter of record, one is subject to be called to order at every possible or seeming discrepancy. Looking into the future, however, offers greater elasticity of imagination.

Nevertheless, it is only by looking ahead that the foundations of any great enterprise can be effectively laid. How many times must Watts have looked ahead before he conceived the true application of steam to human needs for transportation. How many peeps into the future did Edison take between the time when he first gave attention to the presence of electricity as a current over wire and his most recent production in which there are combined motion and sound in the talking-moving pictures of to-day.

To Judge the Future, Observe the Past.

In meeting together at this time for the purpose of organizing a sanitary association for the great Dominion of Canada, it is well for someone to devote a few minutes to looking ahead, in order that the essentials for a successful foundation may be secured. We look ahead best while looking carefully backwards; that is to say, we can plan better for the future in proportion to our thorough comprehension of the things that have taken place in the past.

Sanitation Only a Recent Development.

In the memory of the oldest members here and in the records available to the youngest members here, it can be easily ascertained that public sanitation is a comparatively recent development. Barely more than one hundred years ago, man knew little about himself. The circulation of the blood has been acknowledged grudgingly by some, but the

general public was still under the impression that we were filled with blood very much as the dolls are filled with saw-dust. All human diseases were charged up to God. He did as he pleased and nobody could prevent him.

Less than fifty years ago there were no plumbing ordinances in this country and man had not yet been taught to consider the health of his neighbor in the manner in which he disposed of his domestic wastes.

During the last twenty-five years, public opinion has been aroused and those engaged in dealing with sanitary problems have formed various centres for the interchange of sanitary thinking as evidenced by the creation of sanitary trade journals, and the formation of sanitary organizations known under various names. You see how great a change has taken place in a short time and how this change has practically been forced by the rapid growth of population, and by the increasing complexity of waste disposal problems.

What has happened in the United States, is also bound to happen in the Dominion of Canada. Though your population is ten times smaller than ours, your inhabitable area is as great; your soil offers as many opportunities for profitable development and your population, therefore, will increase in the ratio of the development of your agricultural and mineral resources.

Live Wires Behind the Association.

The formation of this association is an evidence of the realization of the sanitary live wires in Canada that this increase is not only foreseen, but that concerted action is necessary to take care of the consequent sanitary problems as they arise.

First let me advise you to so frame your Constitution and By-Laws that they will provide for the inclusion as members of all those introduced in sanitary engineering matters. There is always a risk that in the formation of a National Association by any one class of men that the Constitution and By-Laws of the Association are limited somewhat in the character of membership, and for this reason the Association does not progress as rapidly as it should.

Field For Sanitarian Rapidly Enlarging.

Since the formation of the American Society of Inspectors of Plumbing and Sanitary Engineers less than a decade ago, there have been various changes made in sanitary matters. We have found that the scope of our activities is constantly enlarging; the plumbing

inspector of to-day is allied with rapidly growing health departments and departments of public safety, and there falls to his lot daily consideration of not only plumbing problems, but problems involving tenement conditions, sewage disposal, water supply, and ventilation. These changes are being brought about by the awakening of public interest to the importance of domestic, municipal and national hygienic methods. We are beginning to be concerned as to how the other fellow breathes; we are interested in knowing whether our neighbor's children have light, heat and air in abundance as required; we are passing laws concerning these things, and the laws bring about a demand for men who will see them properly enforced.

It is only recently that the State of Ohio created a state plumbing inspector, and state supervision of sanitary matters is being sought by all those interested in every other state. A recent letter received by the writer from Mr. Groeninger, the Ohio State Plumbing Inspector, sets forth the great amount of work that is to be done in connection with such an office, and tells of the steady growth of his department and the appointment of sub-inspectors to help him carry out his work efficiently.

This is the beginning of a new era in sanitary engineering. Inspection of plumbing will always be an important part of a plumbing inspector's work, but as the national sanitary conscience grows, the plumbing inspector will find that he is evolved into a fully-fledged sanitary engineer, in the conscientious performance of his duty, and therefore this society should lay the foundation of its work solidly and provide in its membership for all those who are interested in sanitary engineering matters without restriction.

One could go to very great length in outlining the possibilities that lie before us through the next few years. This question of sewage disposal demands very careful study. There is a distinct public sentiment against the further pollution of our streams, rivers and lakes; we are looking for an ideal system of sewage disposal which can be adapted to residential and district needs, and the members of the sanitary engineering trades who will pay the most attention to these suggestions at the present time will be the leaders in their line when these problems are solved satisfactorily in the very near future.

Association Co-operation Beneficial.

I would urge this society to co-operate with our American Society by the

appointment of a committee of research which will be able to work co-operatively with us in the study of all sanitary problems. I would also suggest that your association send to our convention at Louisville in May, several delegates, who I feel sure will benefit by association with us and who will also be able to give us much valuable information during our session. Co-operation is what is needed. In all lines of endeavor we are necessary to each other, and the American Society of Inspectors of Plumbing and Sanitary Engineers will watch with keen interest the development of your organization, and we wish all success to your association and its work, and we invite you to call upon us at all times for assistance and advice should occasion require.

SETTING AND CONNECTING RANGE BOILERS.

(Continued from page 32.)

it up, and continue the flow pipe of the water front to "14," making the connection by means of an ell. They advocate this connection as giving hot water quicker inasmuch as the water will come direct from the water front. This is true, but the amount so drawn would be comparatively small, if most of the water in the boiler were cold at starting. I have never been convinced that the connection heated the water in the boiler any quicker than the ordinary manner, and not so quickly if the boiler be set a half a foot or more higher than ordinarily; or if the circulating system be used. More circulation systems would be used if plumbers understood them better. That isn't a "slam," its the truth. We have men who have not the slightest difficulty in installing a hot water heating job and making it work all right. Give them a circulation plumbing job to put in and they get all "fuddled" up instantan. Why? Simply because they do not regard the bath room as a unit from which the hot water must be brought back. If it was a radiator they'd be hep. The idea of leaving a long line of dead, cold water lying in the hot water pipe between the boiler and faucets of the bath tub and lavatory is beginning to be a thing of the past.

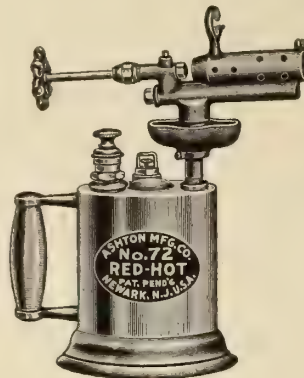
(To be continued.)

Saskatoon, Sask.—Pending the erection of an incinerator in this city, Commissioner Yorath has proposed locating it on the site of the pumping station and utilizing the steam generated in the destruction of the garbage and refuse for pumping water. This, it is claimed, will make a big saving in the operating expense of the pumping station.

NEW PLUMBING GOODS

KEROSENE TORCHES.

The Ashton Mfg. Co., Neward, N.J., makers of the red-hot line of torches and fire pots have added a new kerosene quart torch to their line. The makers claim that kerosene gas produces an intense heat and that the cost of burning is low. The makers claim that their kerosene torch will do any work that can be done with a gasoline torch. The



tanks are made of heavy seamless drawn brass, highly polished and fitted with improved automatic brass pumps. The filler plug is made with air valve for releasing the air pressure. The burners are made of special generator metal with chamber which superheats the gas and with clean out plugs enabling the user to clean easily should it become clogged from impurities in the kerosene.

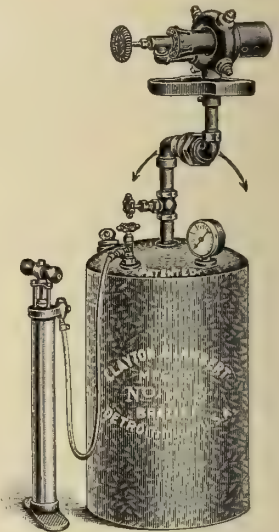
GASOLINE BRAZIER AND STAND.

Clayton & Lambert Manufacturing Co., Detroit, Mich., are offering their



new No. 105 gasoline brazier and stand here illustrated. It is constructed for

heavy brazing and similar work requiring a large volume of flame and intense heat for shop and factory. The brazier is swivelled so that the flame can be turned in various directions, as shown by the cut. It is made with a powerful generator that superheats the gas before it is burned, producing a perfect blue concentrated flame 2 in. in diameter at the burner. The tank is made of heavy galvanized iron, thoroughly braced, with welded seams, and holds 10 gallons. A powerful brass pump produces ample air pressure at all times, and this pressure is indicated by a pres-



sure gauge at the top of the tank. If desired the brazier can be operated in connection with compressed air, thus dispensing with the use of the pump. The brazier is portable and adjustable, as illustrated, and a brazing tripod forms a part of the outfit. This tripod is also adjustable, and the user is enabled to turn the burners in any position, and also adjust the work to the flame. Booklets describing and illustrating the new line will be sent to dealers interested.

PREVENTING ZINC FROM DISCOLORING.

Editor of the Sanitary Engineer.—Please tell me what I can do with some zinc to prevent its becoming discolored?—L.H.M.

We should advise you that, after you are sure that the zinc is as clean as it is possible to get it, the brightness may be retained by covering the zinc with a coat of transparent varnish.—D.C.H.

Necessity and Application of Vent Pipes

Successful Method of Overcoming Syphonage Resulting From Freezing of Vent Terminal—Best Materials to Use for Venting Purposes.

The following paper on the necessity and application of vent pipes, and the material best adapted for venting purposes, was presented by E. Samson, Plumbing Inspector, Winnipeg, before the first convention of Western plumbing and sanitary engineers recently held in that city.

Venting, One of the Essential Principles.

This subject, dealing, as it does, with one of the essential principles of plumbing, opens a wide and every-varying question as to the utility and construction of same.

It is very interesting in reviewing the past years to note what radical changes have taken place in the different branches of our trade and that the methods of to-day will (in the light of further experiments and experiences) be superseded by work done in quite a different manner is unquestionable, although it is difficult for us to see where any further changes for the better can be made.

One of the great recent changes in the venting system is that from the crown, to the continuous waste and vent. Crown venting was considered by old-time plumbers to be the one and only way of connecting up a vent pipe, but on experiments being made it was found that pipes connected in this manner became ineffective after a time by reason of the waste water being thrown partly up into the vent pipe when the fixture was being discharged and leaving a scum. This process being repeated each time the fixture was discharged soon completely closed the connection, and rendered the vent ineffective for the purposes intended.

Three Main Purposes in Venting.

These purposes may be enumerated as follows:—(1) Prevention of syphonage; (2) accelerating the flow of water through the waste pipe by allowing a free flow of air to follow; (3) prolonging the life of the material used on a job by keeping up a circulation of air thus preventing the deleterious effect of sewer gas making itself felt. For this latter reason all vent connections should be made as near as possible to the fixture trap.

Vent Floor Drains Also.

While on this phase of the subject, it should be permissible to suggest that floor drains, if far removed from main drain, should also be vented for the same reason, and those being connected to a perpendicular stack with fixtures

above should receive special attention, also. Although few, if any, plumbing ordinances call for these drains to be vented it is a subject worthy of consideration. On a building where there are plumbing fixtures on different floors, a trunk vent line should be installed with sufficient capacity to supply a flow of air at atmospheric pressure, simultaneously to each branch waste pipe to which it is connected. This trunk line should be connected above into the soil at a point well above the highest fixture, and below into the nearest run of horizontal drain and connections should be left at each floor large enough to accommodate the fixtures to be installed.

Construct so as to Carry Away Sediment.

When constructing a vent line whether a main line or a branch line, connecting to a waste pipe, care must be taken to make connections in such a manner as to allow sediment such as rust or scales, which are from time to time precipitated, to fall into the waste pipe and to be washed away by the discharge of waste water—in other words, horizontal runs of vent piping should be eliminated as much as possible and never permitted at the base of a vent stack.

Freezing of Vent Terminals.

The terminal of vent pipes is an important question in a climate such as Manitoba where terminals carried through roofs are liable to become frozen over during the winter months; this often occasions considerable annoyance to people living in buildings where this happens, as it causes fixture traps to be syphoned, thereby allowing free access of sewer gas into the building. That the vent piping can be installed on a job in such a manner as to obviate this trouble was demonstrated by experiments that were made here recently.

Successful Method of Overcoming Syphonage.

By connecting one end of a vent line into the stack before going through roof and the lower end into the drain, it will be found (in the event of soil pipe becoming frozen at roof) that when a fixture is discharged the air which is thus set in motion, and being helped by the back pressure of sewer, immediately flows up the vent line at its point of intersection with the drain, thus allowing the air from above to follow the discharge and thereby break syphonage. While the same action would take place

with a branch waste line connecting to the drain, it would need much practice to connect a main vent line in the manner stated, and supersede the present method of connecting into the perpendicular stack at a point in the basement. While the latter custom has held good for a considerable period it does not alleviate trouble arising from a stoppage at roof, for the discharge of waste water when passing this point of connection being centrifugal in its action tends to create a vacuum, thus reducing the pressure in the system above, and allowing the outside air to enter, which it does at the point of least resistance, forcing the water through some trap, in its endeavour to alleviate unnatural conditions, thereby leaving an opening for sewer air to escape into the building. Previous to the time when it became compulsory in this city to re-vent plumbing fixtures, considerable trouble was experienced by the stoppage of branch waste pipes. Owing to the sluggish flow of waste water through these unvented pipes, each discharge would leave a percentage of scum around the interior sides of the waste, which soon became completely choked. More especially was this trouble apparent in sink water pipes. Owing to the construction of plumbing work at the present time, this trouble has been greatly lessened, the flow of waste water being accelerated by the flow of air behind from the vent line, thus allowing less time for precipitation.

Introduction of Galvanized Pipe.

Lead as a factor in plumbing construction is gradually being eliminated, being superseded by galvanized wrought iron, this material being especially suitable for venting purposes, owing to the slight amount of decomposition which takes place and the facility with which it can be installed. Unlike lead this piping does not lend itself so readily to mutilation at the hands of careless or incompetent workmen. Lead piping after having been installed by this class of men will soon commence to crack and break away at the wiping. Especially is this apparent where it is open to fluctuations of temperature.

Rapid Decomposition of Black Pipe.

Black wrought iron pipe is often used for venting purposes, but its use should be condemned at all times owing to the rapid decomposition which takes place, thus causing unavoidable runs of horizontal vent soon to become completely

closed by the accumulation of rust. To remedy this trouble a coating of asphaltum has been tried, but during the process of transshipping from factory to job and sundry jars which it receives during the process of installation, a considerable quantity of this coating becomes detached, leaving the base iron

open to the same deleterious effect. Cast iron piping is durable and efficient as a vent, and is often used for a main line, but for other venting purposes its installation is too costly. We therefore revert again to galvanized iron.

Most plumbers are prejudiced in favor of lead, both for venting and waste

purposes, claiming that the introduction of so much iron piping into the business is killing their handiwork. Although this is in a measure correct, plumbers must not forget the fact that plumbing work is fast evolving from a trade to a science, and thus the introduction of iron pipe should be welcomed.

Rules for Successful Greenhouse Heating

Steam Heating vs. Hot Water Heating—Vote of 100 Growers Taken on System Preferred—Methods of Figuring Amount of Radiation Necessary—Various Advantages of Wrought and Cast Iron Boilers.

Some interesting statistics regarding greenhouse construction and equipment, as well as some successful rules for calculating the radiation requirements, were given in a paper by Prof. W. J. Wright, read at the recent annual convention of the Vegetable Growers' Association, in Rochester, N. Y. Prof. Wright communicated with 100 growers on subjects ranging from cost of construction to pitch of roof. One of the questions asked was the kind of heat preferred by the owners. 86 per cent. of those having 20,000 sq. ft. or more under glass, preferred steam heat. The chief reasons stated being "better control," "cheaper maintenance," and "less shade from pipes." Six per cent. preferred a combination of hot water and steam, using the steam as a help in extreme weather and for use in soil sterilization. The remaining 8 per cent. preferred hot water, stating as their reasons "steadier heat," "plants grow better," "pipes do not rust out during the summer as with steam," and "cheaper to operate when but little heat is required."

Of those having less than 20,000 sq. ft., 74 per cent. preferred hot water, giving in addition to the reasons named above "less labor to fire, especially at night," and "needs no night firemen." Of those using hot water, 21 per cent. were using some form of mercury pressure system or "generator" and 14 per cent. more believed them desirable. The reasons given were "needs less piping" and "circulation better."

The average amount of soft coal a grower for each 1,000 sq. ft. of area covered (all kinds of heat) was 11.6 tons and the average price was \$2.33 per ton, delivered.

Heating Calculations.

The calculations for greenhouse heating are based on certain simple fundamental facts which may be stated briefly as follows:

A square foot of glass will give off, under ordinary greenhouse conditions in

winter weather, approximately 1 B.T.U. of heat for each degree difference in temperature between the temperature of the air inside the greenhouse and that outside. In hot water heating, the heating coils will give off 2 B.T.U. a square foot for each degree difference in temperature between that of the coils and that of the surrounding air.

Suppose, for example, that a house contains 1,000 sq. ft. of glass and that it is desired to keep it at a temperature of 60 deg. F. and that the lowest temperature that may be expected is 10 deg. below zero. The number of B.T.U. given off by such a house each hour would be 60 deg.—(—10 deg.) \times 1 \times 1,000, or 70,000 B.T.U. In hot water heating the average temperature of the heating pipes may be assumed to be 160 deg. and if the temperature to be maintained in the house is 60 deg. the difference will be 100 deg. Since each square foot of pipe will radiate 2 B.T.U. each hour for each degree difference in temperature, under these conditions 1 sq. ft. of radiating surface will give off about 200 B.T.U.

Dividing the 70,000 B.T.U. given off by the glass surface by 200 will give us 350 or the number of square feet of radiation necessary.

These principles may be embodied in the following formula:

$$\frac{(T-t) \times G}{(160-T)2} = R.$$

In this formula R=the number of square feet of radiation, T the temperature to be maintained inside the house, t the lowest outside temperature to be expected, and G the number of square feet of glass and equivalent glass.

Glass will give off about six times as much heat as a good, substantial, well-built wall. To find the amount of heat radiated by any house, therefore, find the number of square feet of exposed glass and add to it 1-6 of the exposed wall surface.

Take, for example, a house where the total glass surface amounts to 4,205 sq. ft. and the exposed wall surface is 480

sq. ft., which divided by six gives an equivalent of 80 sq. ft. of glass or a total of 4,285 sq. ft. of glass and equivalent glass. If we substitute these values in our formula it becomes as follows:

$$60 - (-10 \times 4,285) = 1,450 \text{ sq. ft.,}$$

(160—60)2
which is the number of square feet of radiation necessary to heat this house to 60 deg. F. when the weather outside is 10 deg. below zero.

To find the number of linear feet of pipe necessary to supply the required radiation, it is necessary only to find the amount of radiating surface in one linear foot of the size of pipe it is desired to use. For example, one linear foot of 1½-in. pipe furnishes about 0.5 sq. ft. of radiating surface. Dividing 1,450 by 0.5 gives us 2,900 linear feet of 1½-in. pipes necessary to heat the house, and if the house is 90 ft. long, it would be necessary to use 32 lengths of 1½-in. pipe. Since, however, these pipes must be fed by flow pipes which carry the hot water, and since these flow pipes radiate heat, the number of coils may be somewhat reduced. But to allow for a margin of safety it would probably be well to use about thirty 1½-in. hot water heating pipes. Pipes this size are large enough for coils 150 ft. or less in length.

Amount of Radiating Surface in a Linear Foot of Wrought Pipe of Various Sizes.

Size of pipe, inches, diameter.	Amount of surface per linear foot.
1	0.344
1¼	0.434
1½	0.497
2	0.621
2½	0.752
3	0.916
3½	1.044

Steam pipes are hotter than hot water pipes as ordinarily used, and therefore houses heated with steam require less radiating surface than those heated with hot water. Steam is usually carried at

about 2 lbs. pressure and at that pressure has a temperature of about 218 deg. F. In condensing to water this steam gives up its latent heat (approximately 1,000 B.T.U. a pound). One square ft. of radiating surface will condense a little more than $\frac{1}{4}$ of a pound of steam each hour, assuming that the conditions are the same as above; namely, that the temperature in the house is to be maintained at 60 deg. F. with an outside temperature of—10 deg.

In other words, 1 sq. ft. of steam radiating surface will give off about 260 B.T.U. per hour. We then have

$$\frac{60 - (-10) \times 4,285}{260} = 1,153$$

sq. ft. of steam radiation required, or 2,306 linear feet of $1\frac{1}{2}$ -in. pipe, or 25 lengths of $1\frac{1}{2}$ -in. pipe extending across the length of the house, which would be equal to about 30 lengths of $1\frac{1}{4}$ -in. pipe, which is the size generally used in steam heating for coils 150 feet or less in length. In practice much less steam radiation is usually provided, with the understanding that a higher pressure and consequently a higher temperature will be maintained in severe weather.

Steam Versus Hot Water.

While our inquiries showed that 86 per cent. of the larger growers preferred steam for heating, it is true that many of the more modern large ranges are being equipped with hot water. This is done for the reason that crops are supposed to grow better under hot water than under steam heat. It is probably true that plants do not do as well in the superheated air near a hot steam pipe as they do near an old-fashioned $3\frac{1}{2}$ -in. hot water pipe at 150 deg. F.

On the other hand, the modern tendency is to place all or part of the pipes overhead and far enough away from the plants so that the heat is evenly distributed. It is also true that in many of these hot water systems which are being installed a "pressure" system is being used which makes possible the raising of the temperature of the water to 240 deg., which is equal to 10 lbs. of steam. This is a higher pressure and consequently a higher temperature than is usually carried by the ordinary steam heating plant. During the spring and fall the hot water has some advantage because it can be kept at a low temperature, while steam must always be at 212 deg. or more.

Generator or Pressure System.

The so-called generators or pressure systems depend for their action upon a column of mercury which must be forced up out of the way before the heated water can find its way to the expansion tank. They usually exert about 10 lbs. pressure. These generators are automatic in their action and are claimed by

the manufacturers to produce a more rapid flow of water in the heating pipes. The same effect may be secured by elevating the expansion tank or by having a closed expansion tank fitted with a safety valve set at a certain pressure. In long houses it is necessary to supplement gravity circulation by pumping. This may be also done under pressure.

Wrought or Cast Boilers.

The cast-iron boiler has a size limit above which it is impracticable to go. Moreover, there is evidence that with its thick water ways it is less economical of fuel than are the thinner shelled wrought-iron boilers. On the other hand, cast-iron boilers do not rust as badly as wrought-iron ones when not in use and have no flues to be burned out by the sulphurous gases and to cause annoyance and expense in replacing. But they do sometimes crack and they have a disgusting way of doing it at the most inopportune moment.

When fuel is cheap and abundant, and especially in a small range where the heating system is likely to be neglected during the summer, cast iron boilers usually give the best satisfaction. Where coal is expensive, and especially if it is of good grade and free from sulphur, wrought-iron boilers are probably best. No matter what kind of heat or kind of boiler is used, it is always best to use two small boilers, both of which may be connected with the main system, than one large one. One of the small boilers will take care of the house during the spring and fall more economically than a large one and in case one goes wrong during the winter weather the other may be "forced" for a few days and save the crop, when if one large boiler was depended on, the crop would be ruined.



GUARANTEE. LASTS. ONLY ONE YEAR.

Editor of the Sanitary Engineer.—The thirty gallon boiler on a job which I installed sixteen months ago, has begun to leak, and the owner wants me to instal another boiler free of charge, claiming that although the guarantee specifies only one year, it is an understood and unwritten law that it should last for five. Has he any claim on me, and should I comply with his request? He is a lawyer, and so I think he may be right.—P.F.A.

Certainly you are under no obligation whatever. Your boiler has already lasted four months or one-third of the time guaranteed, beyond the limit to which you were responsible. Your lawyer friend cannot hold you for anything beyond the year, which is now past. You might ask him, however, whether in his profession he takes anything for granted or whether he keeps within the

limit of the law in dealing with clients.—D.C.H.



"KNOCKING" THE NEWSPAPER DOESN'T PAY.

Editor of the Sanitary Engineer.—The editor and owner of the newspaper that is published in our town is one of the smallest persons that walks in shoe leather. He never gives us fellows a lift (in print) and seems afraid to speak the word plumber, even to publish the stale jokes that have been got out for our benefit at various times. Now what could you do along brightening things up with such a dead one in your town?—246.

We note the remarks of the disgusted plumber and believe that part of the fault is his own. The space in the paper is for sale, and if the editor gives it all away his cash would be mighty little. Just why this plumber should expect the editor to give him a lot of notoriety free is what we do not understand. We believe that if our plumber friend would get down to business and BUY a couple of columns of space in that paper and pay promptly, that he would then discover that that self same editor was not the worst man in the world. The newspaper is the spreader of news, and, incidentally, of civilization and it has been our observation that it does not pay any one to "knock" their town paper. The editor will have a hard enough time to get along, let things come at the very best, and if you want your town to appear prosperous, do all you can to support the man who is probably lying awake at nights thinking up new things that he can publish to boom the town. If he gets downhearted it will be reflected, to a certain extent in the columns of the paper and your place will not get the live publicity it needs. Buy some ad space Mr. "246" and see how it works out.—D.C.H.



MAKING THE LEAD RUN INTO CROWDED HUB.

Editor of the Sanitary Engineer.—Sometimes the soil pipe is almost large enough to fill the hub, or it gets crowded to one side and it is very hard to make the lead run all around the pipe. Is there anything that can be done to make the joint run in better style?

T.V.G.

Get all the room possible all around the pipe and firmly caulk the oakum to hold the pipe to the best advantage. Before pouring the lead take your oil can and squirt some lard oil all around the pipe; not a very heavy dose will be required. Then pour the lead and, when cool, caulk to place.—D.C.H.

Complete Course of Sheet Metal Work

By L. W. KOSER

Problem 1—Triangulation.

Now let us take up a simple problem in triangulation, viz., the transition piece of the tubular ventilator shown on Plate 28 and shown again by Fig. 1, Plate 29, and in perspective at Fig. 1-A.

As will be seen the transition piece goes from a square at the bottom to a round at the top.

Let us draw a plan as shown by Fig. 2, first drawing the square base A-B-C-D to the size desired, say 3 inches square,

then in the centre we will draw the circle representing the top.

Then draw the elevation Fig. 3 giving a side-view.

Now to return to the plan, let us divide the circle off into any number of equal spaces, say 8, having the points so that an equal number of lines can be drawn from each corner of the square into these parts and each line will be the same length as the same line in the other corners.

A good way to accomplish this is to draw the diagonal lines across the square from points A to C and from B to D, stopping them at the circle.

Then subdivide the space between these on the circle and draw lines from the corner into each point.

Now each one of these lines A-1, A-2, B-2, B-3, etc., represent the base lines of a triangle the same as A-B of Fig. 6.

Now to get the altitude or height of the triangle we must go to the plan.

29



FIG. 1-A, perspective view

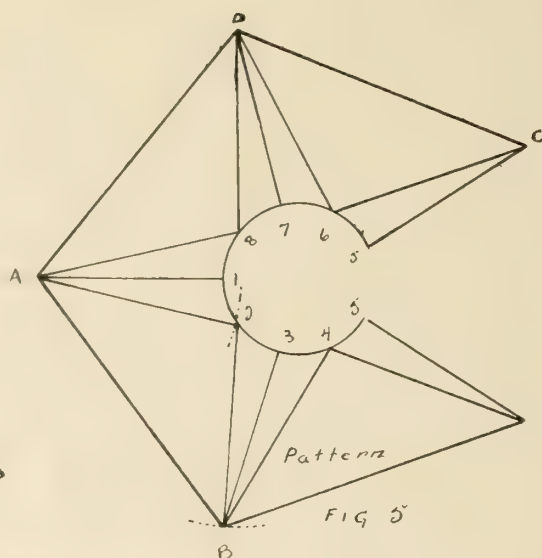


FIG. 5

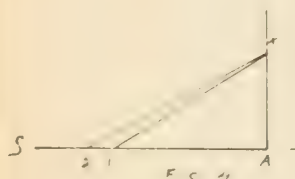
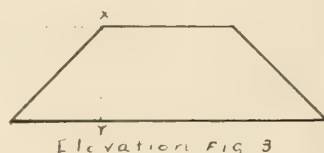
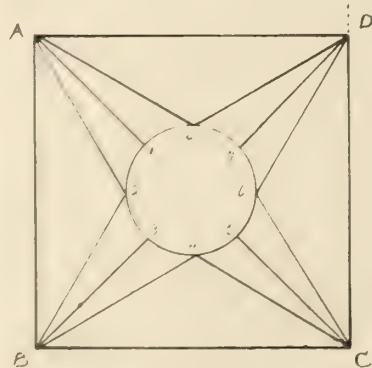


FIG. 4



Elevation FIG. 3



Plan FIG. 2

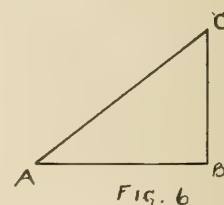


FIG. 6

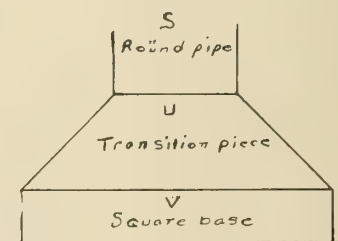


FIG. 1

PROBLEM 1 TRIANGULATION

This height is shown by X-Y.

Now let us draw a horizontal line as S-A, Fig. 4. Then from A, Fig. 4, let us set off on this line the spaces A-1 and A-2 of the plan.

At A erect the perpendicular line A-X, making it equal to Y-X of the elevation.

Then a line drawn from X to 1 and X to 2 gives the true length of the lines A-1 and A-2 of the plan, which are the lines we needed to find to give us the width of the pattern.

This we call our "diagram of triangles" and as B-3, C-5, D-7 on the plan are the same as A-1 and all other lines the same as A-2 it is only necessary that our diagram shows two triangles, viz., the true length of A-1 and A-2.

We are now ready to develop the pattern.

We will first draw at Fig. 5 a line

equal to X-1 of Fig. 4, which represents with the compass set to X-2 of Fig. 4 we place the point at A, Fig. 5, and swing an arc as shown by the dotted line.

Then set the compass to the space 1-2 of the plan and with the point at 1, Fig. 5, cut the arc, thereby locating the point 2 of Fig. 5.

Then with the compass set to X-2 again and with 2, Fig. 5, as centre, swing an arc as shown by the dotted line at B.

Then set the compass to A-B of the plan and with A, Fig. 5, of the plan as centre cut the arc at B.

Then with the compasses set to 2-3 of the plan and 2, Fig. 5, as centre swing an arc near point 3.

Then with the space X-1 and B as centre cut the arc, locating the point 3.

This gives one quarter of the pattern.

Continue in this way until the whole pattern is developed.

Connect the different points.

Allow for flanges and fold.

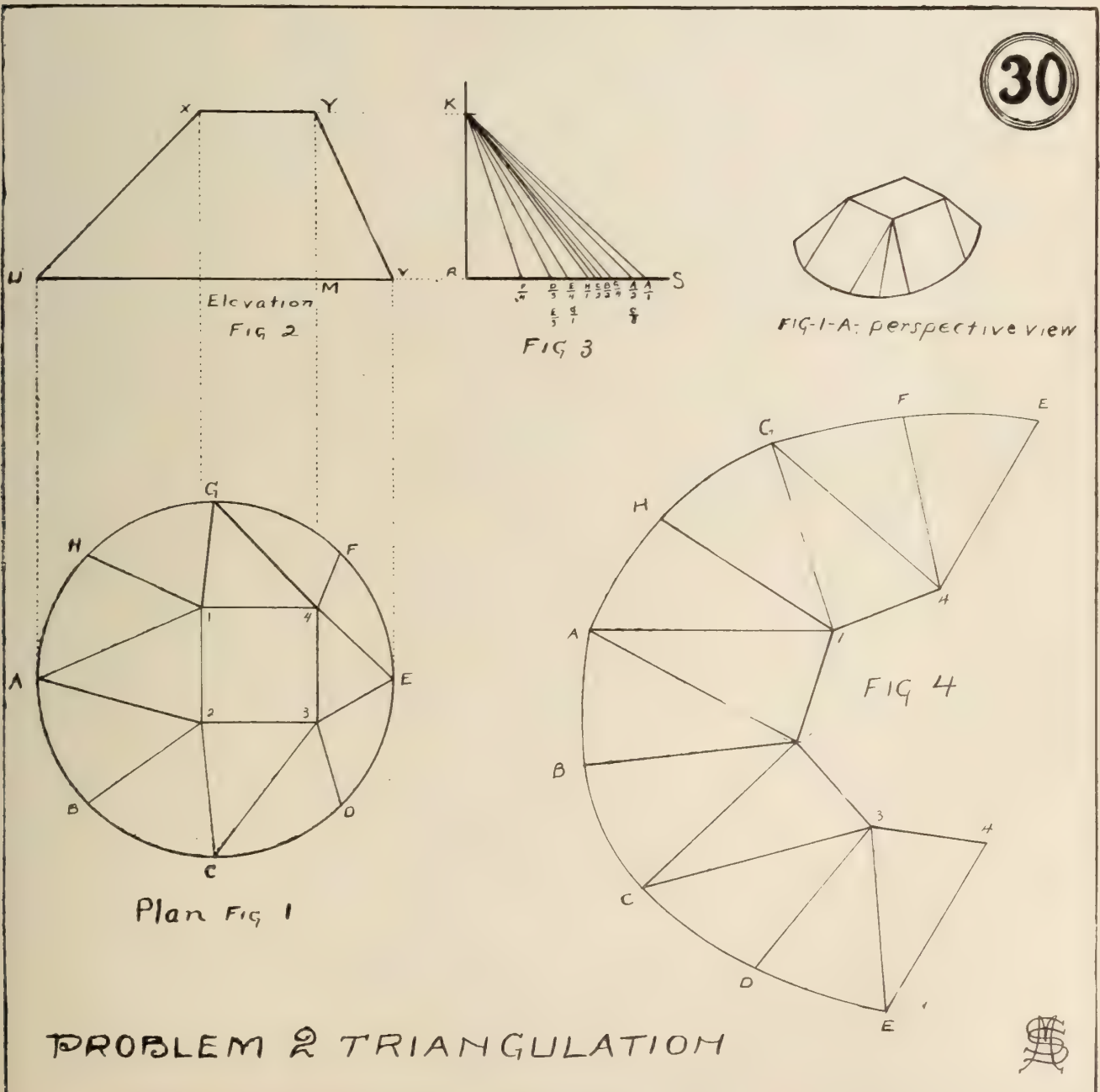
In problem 2, plate 30, we illustrated a Transition piece going from a round at the bottom to a square at the top (the opposite to problem 1). The square top is also set off to one side of the centre.

It could be set in the centre and the process would be the same, but by setting it off to one side it better prepares the student for meeting and overcoming this class of work.

A perpendicular view of the article is shown at Fig. 1-A.

Let us first draw the plan, Fig. 1, by drawing the circle or bottom the desired width of diameter, say about 4 inches, for practice.

(Continued on page 40.)



Plumbing and Heating Markets

TORONTO.

Toronto, May 31.—Manufacturers and jobbers are inclined to be rather more optimistic with regard to future business than for some time. In the East, building is going right ahead. Permits for large contracts have been taken out, and speculative building in Toronto is claimed by many to be even in advance of last year's high-water mark, and in outside towns to be coming right along. Manufacturing is increasing to such an extent that houses have to be provided for the influx of population. For this reason jobbers seen no reason why trade in their line should be marked for long with any great dulness.

From the West reports are not so encouraging. One jobber states that should the Western situation hold it will undoubtedly be reflected in the East, but with good crop prospects, and continued heavy immigration, there is little reason to fear any depression more marked than that at present.

Plumbers appear to be going at work in a more canny manner than in former years. Those who realize the situation are taking only such jobs as are sure to be paid up quickly, and leaving for the more fool-hardy in the trade all other work.

Trade, however, is brisk. Boiler manufacturers report a decided increase over last year and the same holds in many other lines. Were the money situation to be relieved, business would undoubtedly boom.

Enamelware.—Market here holds firm, but without any further changes in price. Any move would almost undoubtedly be upward. Demand is exceptionally heavy.

Iron Pipe and Fittings.—Prices announced last issue still prevail as follows: $\frac{1}{4}$ and $\frac{3}{8}$ in. \$2.28; $\frac{1}{2}$ in. \$2.72; $\frac{3}{4}$ in. \$3.28; 1 in. \$4.85; $1\frac{1}{4}$ in. \$6.56; $1\frac{1}{2}$ in. \$7.84, and 2 in. \$10.55. Galvanized is quoted at $\frac{1}{4}$ and $\frac{3}{8}$ in. \$3.18; $\frac{1}{2}$ in. \$3.57; $\frac{3}{4}$ in. \$4.23; 1 in. \$6.55; $1\frac{1}{4}$ in. \$8.86; $1\frac{1}{2}$ in. \$10.59, and 2 in. \$14.25.

Fittings continue firm as ever, but with no quotable change. Discounts are as follows: Cast iron fittings, 65 per cent. off; malleable iron fittings, 40 per cent. off; cast iron bushings, 65 per cent. off; malleable iron bushings, 65 per cent. off; nipples, 75 per cent.; headers, 60 per cent.; flanged unions, 65 per cent.; malleable lipped unions, 65 per cent.

Soil Pipe.—From a manufacturers standpoint business is exceptionally heavy and factories continue to run at full capacity. In Toronto jobbers appear to be stocking up in anticipation of an advance, but in some other distributing centres stocks are moving out as fast

as obtained. An advance before the end of the season would not be surprising. Discounts are: Medium and heavy, 60 and 5 per cent.; 7 and 8-inch sizes, 45 per cent.

Advance in Lead Pipe.

Lead Pipe.—Further advance has been made in lead pipe and waste, discount now being 10 per cent. instead of 15 per cent. as formerly. Market continues firm at higher level, owing to advancing tendency of primary market due to scarcity. Lead pipe is now at $7\frac{1}{2}$ c less 10 per cent. and lead waste at 9c less 10 per cent. This is the second advance within a few weeks. Traps and bends are still at 40 per cent. off list.

Solder.—Quotations for some firms are: Easy wiping, 26, star, 28, and half and half 30. Others quote strictly half and half $28\frac{1}{2}$, and still others $28\frac{3}{4}$ to 31c, according to quality.

Great firmness prevails in this market, owing to advancing tendency of tin and lead.

Boilers and Radiators.—One firm claims an increase of 25 per cent. over last year's volume of business in boilers to date. Business in both lines is very brisk, and shows every prospect for a good season.

Metals.—Following a decline of $\frac{1}{2}$ cent per lb. in tin last week, an advance of $\frac{1}{4}$ cent has been made this week. Toronto quotations range from $53\frac{3}{4}$ to $54\frac{1}{4}$ c per lb.

Sheet lead has also advanced $\frac{1}{4}$ c per lb. this week.

Spelter has declined 25c per 100 lbs., and even at that only a fair business is being done.

Lead continues unchanged, quotations being from \$5.20 to \$5.70 per 100 lbs. Caulking lead continues at $6\frac{1}{2}$ cents for small lots, and 6c for 200 lbs. or over.

No change has been made in copper quotations still being \$16.10 to \$16.25 per 100 lbs.



COMPLETE COURSE OF SHEET METAL WORK.

(Continued from page 39.)

Then we will draw the square wherever we want it located, but in order to follow the explanation of the problem it is better that we locate it as near as possible as shown by the plan.

Now let us draw the elevation as follows:—

Directly over the plan and some distance above it draw the line U-V equal to the diameter of the plan.

Then we will draw the line K-Y the desired height representing the top of the transition piece and directly over the square on the plan. Then we draw the

lines U-X and Y-V thus completing the Elevation, Fig. 2.

Now let us divide the circumference of the plan, Fig. 1, into any number of equal spaces, say 8, as in this case.

Then number each of the corners of the square as 1, 2, 3, 4, as shown.

Now draw lines from each of the corners to the points on the circumference nearest to them. These are the base lines for our triangles.

Now extend the line U-V as shown by R-S and erect a perpendicular line from R making the distance R-K equal to Y-H.

Now lay off on the line R-S from R each of the base lines shown on the plan, for instance, lay off the line A-1 from R and mark it A. Draw a line from A-1 to K which gives the true length of the line A-1 I of the plan.

Now lay off A-2, B-2, C-2, C-3, etc., as shown and draw lines to K.

It will be noticed that where two or more Base Lines are the same that we simply place the extra number or numbers under same.

The Students' Diagram of Triangles, however, may be a little difficult to the one shown here; for instance, lines A-2 and C-3 may not be the same in that case; he would simply draw another line to the point where C-3 came.

Having now drawn our plan which gives us the distance around the bottom and top and having our diagram of triangles giving us the true width of the side of the pattern at the different points we proceed to develop the pattern as explained.

For Problem 1, viz: we first draw a line A-1, Fig. 4, making it equal to A-K, Fig. 3.

Then set the compass to A-3-K, Fig. 3, and with A, Fig. 4, as centre, swing an arc about the distance from 1 as 1-2 appears to be on the plan.

Then with the compass set to 1-2 of the plan and with 1, Fig. 4, as centre, cut the arc, thereby locating point 2.

Then with B-2-K as radius and 2, Fig. 4, as centre, swing an arc at about the place where B would come.

Then with A-B of the plan as radius and A, Fig. 4, as centre, cut the arc locating the point B. Also with the same radius and B as centre, swing around to about where C would come.

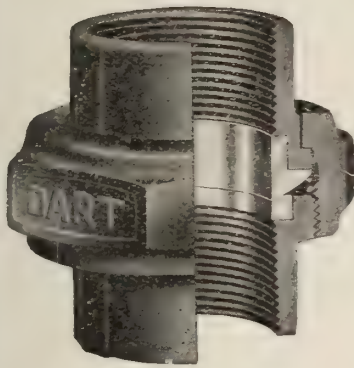
Then with C-2-K as radius and 2, Fig. 4, as centre, cut this arc locating C.

Then with C-3-K as radius and C as centre, swing an arc near where point 3 should be and with 2-3 of the plan as radius and 2, Fig. 4, as centre, cut the arc locating 3.

Continue this until the pattern is finished.

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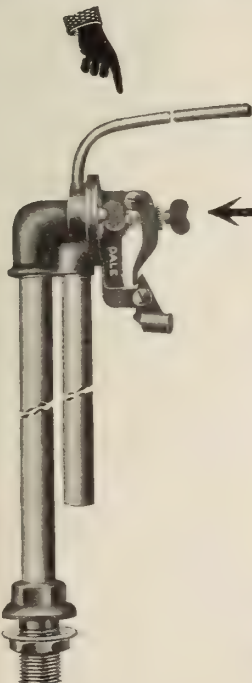


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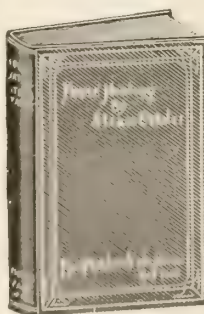
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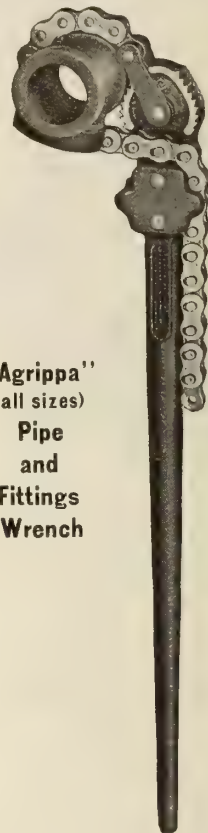
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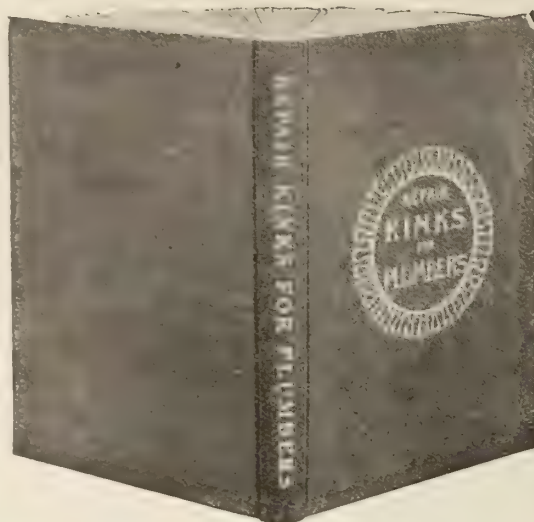
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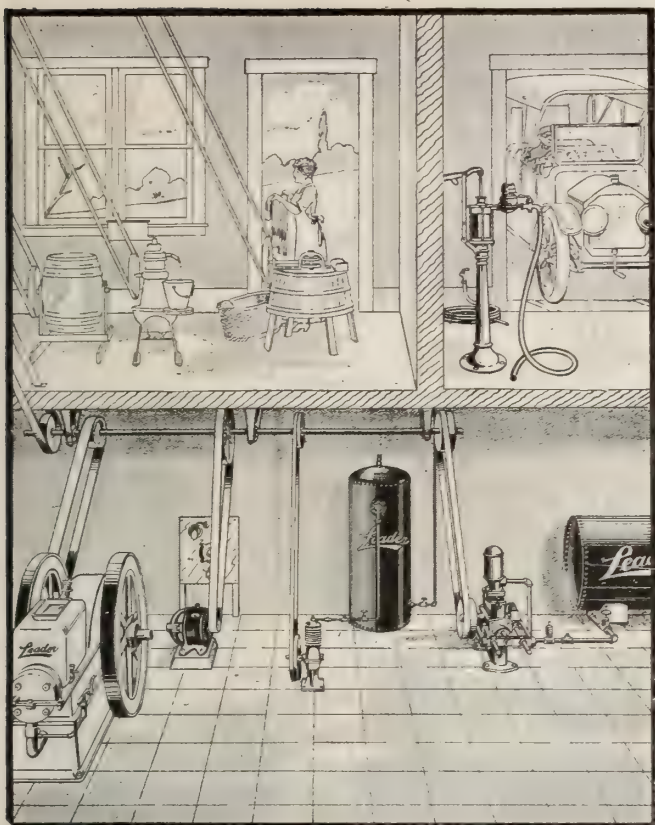
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Above illustration taken from front cover of Leaderite.
Published monthly by Leader Iron Works.

Take All In One Order

¶ The Water Supply Equipment of country and suburban estates is now looked upon as work that legitimately belongs to the pipe fitter and should include the installation of power, whether gasoline engine, steam, electric motor, or whatever style is most suitable for the place; also pumps and all the connections required in assembling the plant. Architects to-day very generally link the water equipment with the plumbing specifications.

¶ Gasoline Storage Outfits, have been largely considered an outside line, as far as pipe work contractors are concerned, and were usually sold by specialists. Why so, when it simply consists of a tank and pump, the installation being but a few moments work? Contractors should watch this field. The advancing price of gasoline encourages quantity storage. Make it a point to at least inquire of customers, who are automobile owners, if they have considered the advantage of a storage outfit, also **Special Air Storage Tank and Compressor** for inflating automobile tires. Those who are not convenient to public garages furnishing a free air supply, sometimes get mighty tired of pumping air by hand. Watch your chance. The rural people are buying both gasoline and air storage outfits. Someone will get this business, why not you?

¶ The ideal method now is to install a chain of machines *operated from one line shaft* (see above illustrations) such as washing machine, churn, cream separator, as well as pump, air compressor, and in fact anything in the form of power driven appliances. It is to your interests to familiarize yourself with the entire line of

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Satisfied Customers and Big Profits



When your clients ask for a high-grade combination at a moderate price, show them the "J-M 1913." This outfit places you absolutely beyond competition.

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You can't make a mistake when you install the

J-M 1913 Vitreous China Combination

Every one that you put in brings you a larger profit than is usual on goods of this kind, and is a permanent advertisement for your business. Tank and bowl are of vitreous china. All exposed metal parts heavily nickel plated.

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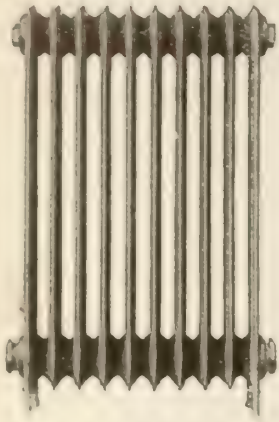
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Manufacturers of Asbestos and Magnesia Products **ASBESTOS** MARK Asbestos Roofings, Packings, Electrical Supplies, Etc.

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A New Radiator Design



the INVINCIBLE — is characterized by the much increased air space between sections.

This design is specially adapted for homes, hospitals, sanitariums, as well as for all other buildings where particular efforts are made to secure absolute cleanliness and high efficiency.

The large open spaces between the sections permit all parts of the radiator easily to be kept as clean as a tile floor. They also permit the heating and distribution of unusually large volumes of air, which particularly efficient as a

makes the INVINCIBLE heating unit. The

Pressed Metal INVINCIBLE

has all the other advantages of the well known Kinnear Improved Pressed Metal Radiators, such as thin walls, about 1-3 the weight of a cast iron radiator of the same rated capacity, quick and positive action, uniform distribution of heat, rounded artistic appearance, and occupies little

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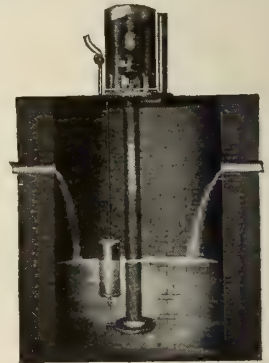
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will automatically EJECT any QUANTITY of Sewage at any HEAD. They are adapted for MUNICIPAL DISPOSAL PLANTS and CITY BUILDINGS. The ECONOMY may be operated by ELECTRICITY, STEAM or GAS ENGINE.

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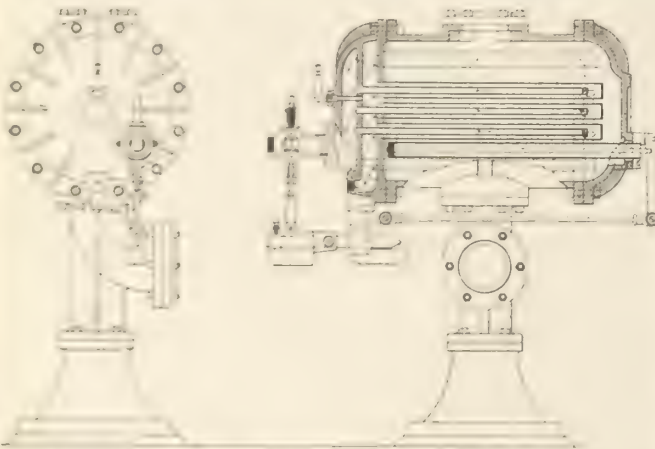
Automatic Electric Bilge Pump

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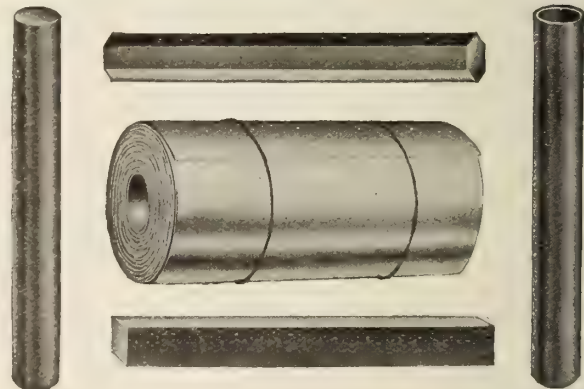
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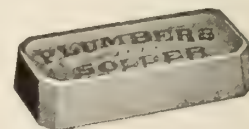
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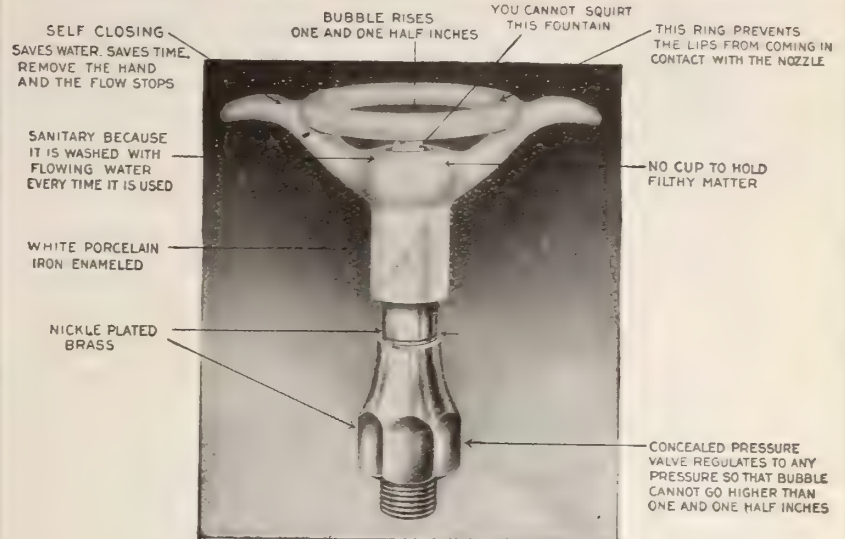
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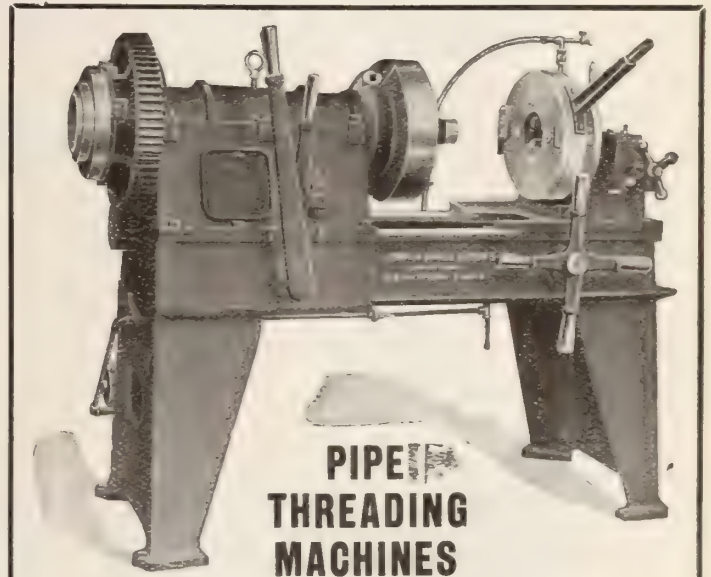
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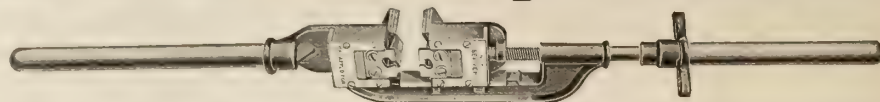
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Made in Canada

of the best material and by skilled mechanics, some of them of superior ability, having worked several years on this line in some of the best factories in the United States. Our machines have been in successful operation in all the Pipe Mills, and many of the best Plumbing and Steamfitting businesses in the Dominion for years, and for the above reasons, we believe we can satisfy **YOU**. We are there with the goods. References cheerfully given. Write us for catalogue.

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One Set of Dies
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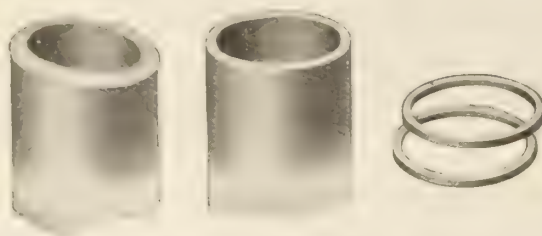
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The ⁶⁶SYDENHAM⁹⁹ Quick Opening Bibb

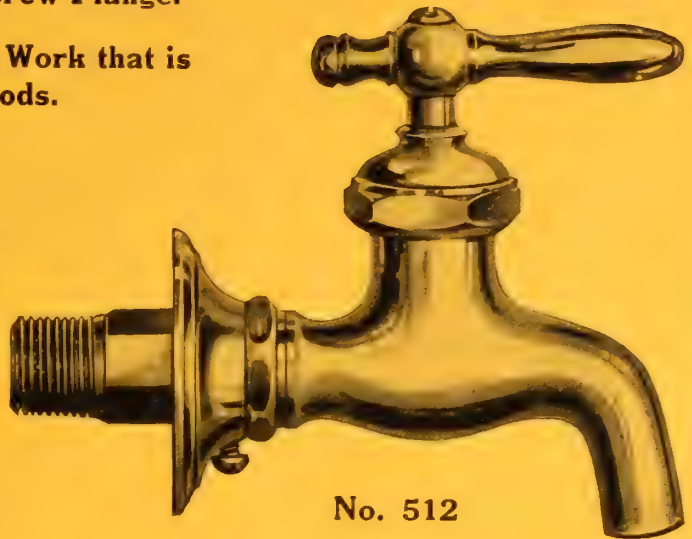
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The demand for this bibb is already large, and
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Vol. VII.

Publication Office : TORONTO, JUNE 16, 1913

No. 12



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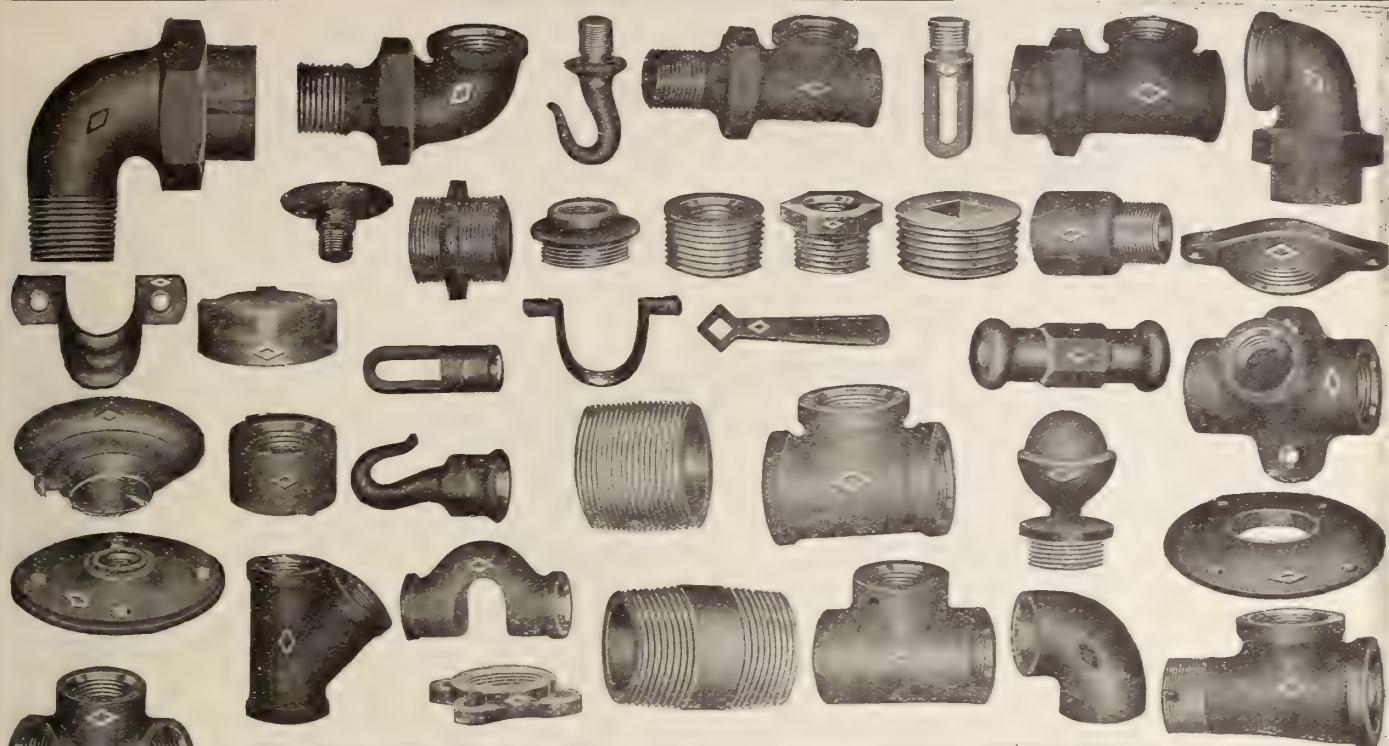
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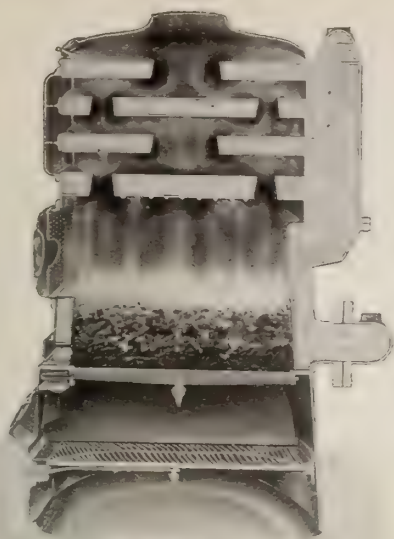
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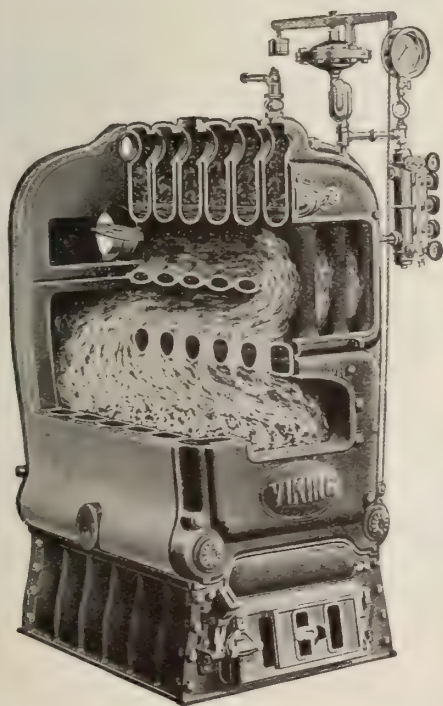


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An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

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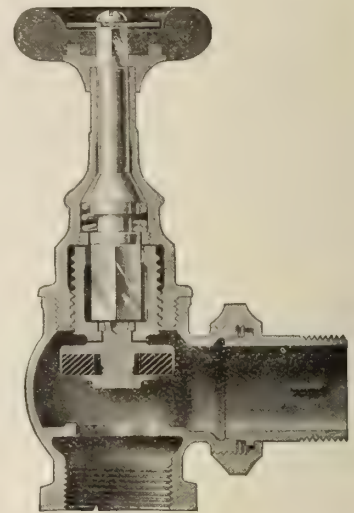
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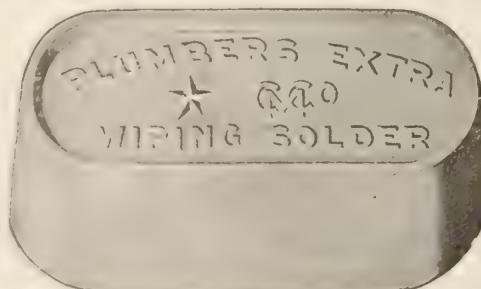


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buy the Solder with the Tin
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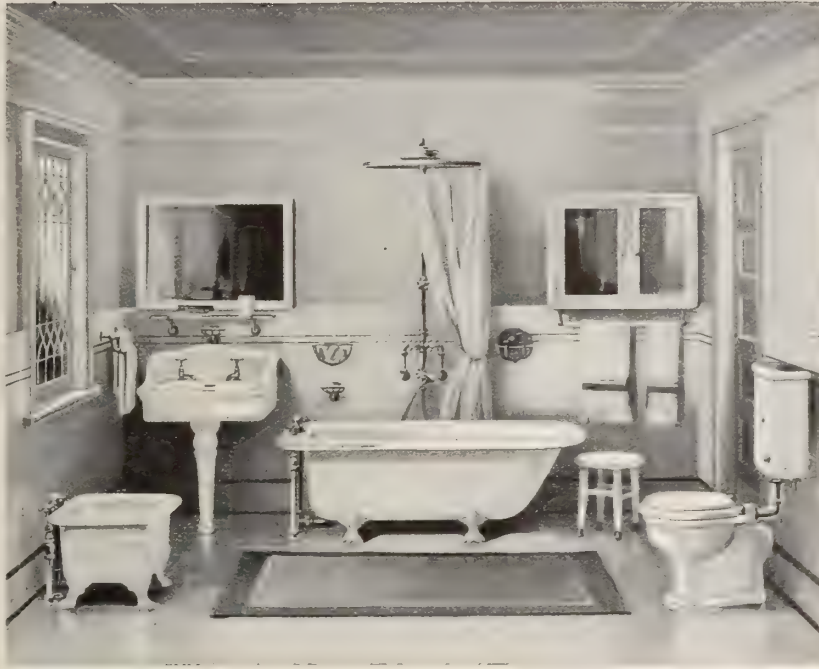
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NO LEAK IN THE SYSTEM

Can Escape the Notice of the
Sanitary Engineer if the

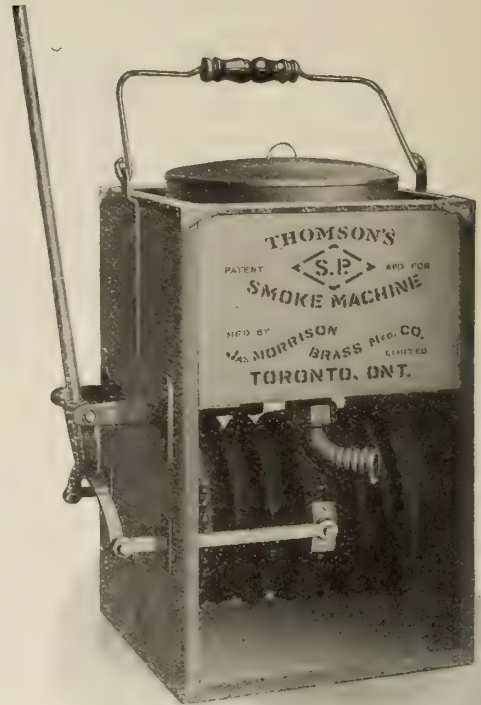
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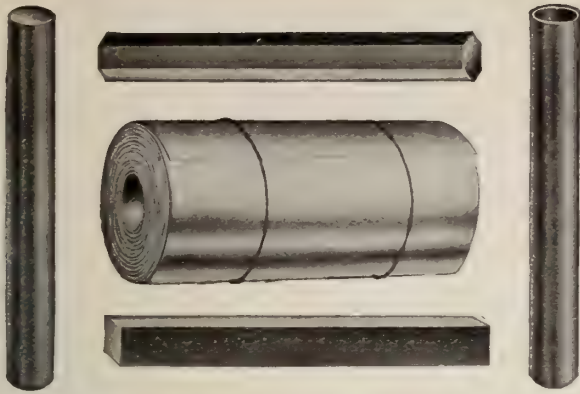
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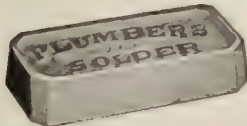
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Solder



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of Scientific Management

Something in it for Every Advertiser, Advertising Manager,
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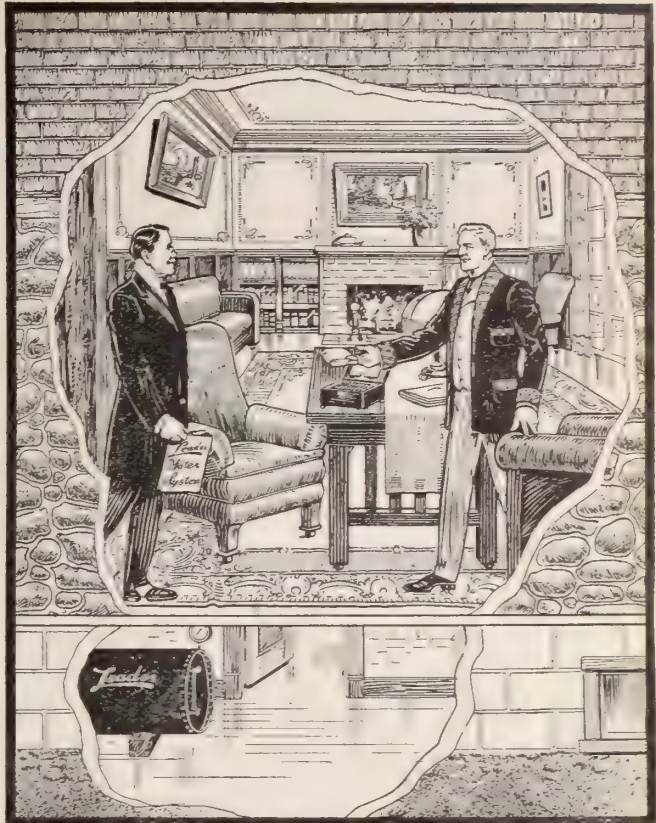
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TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co.,

143-149 University Avenue, Toronto



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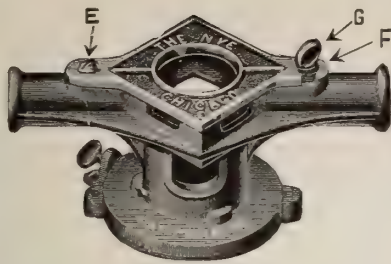
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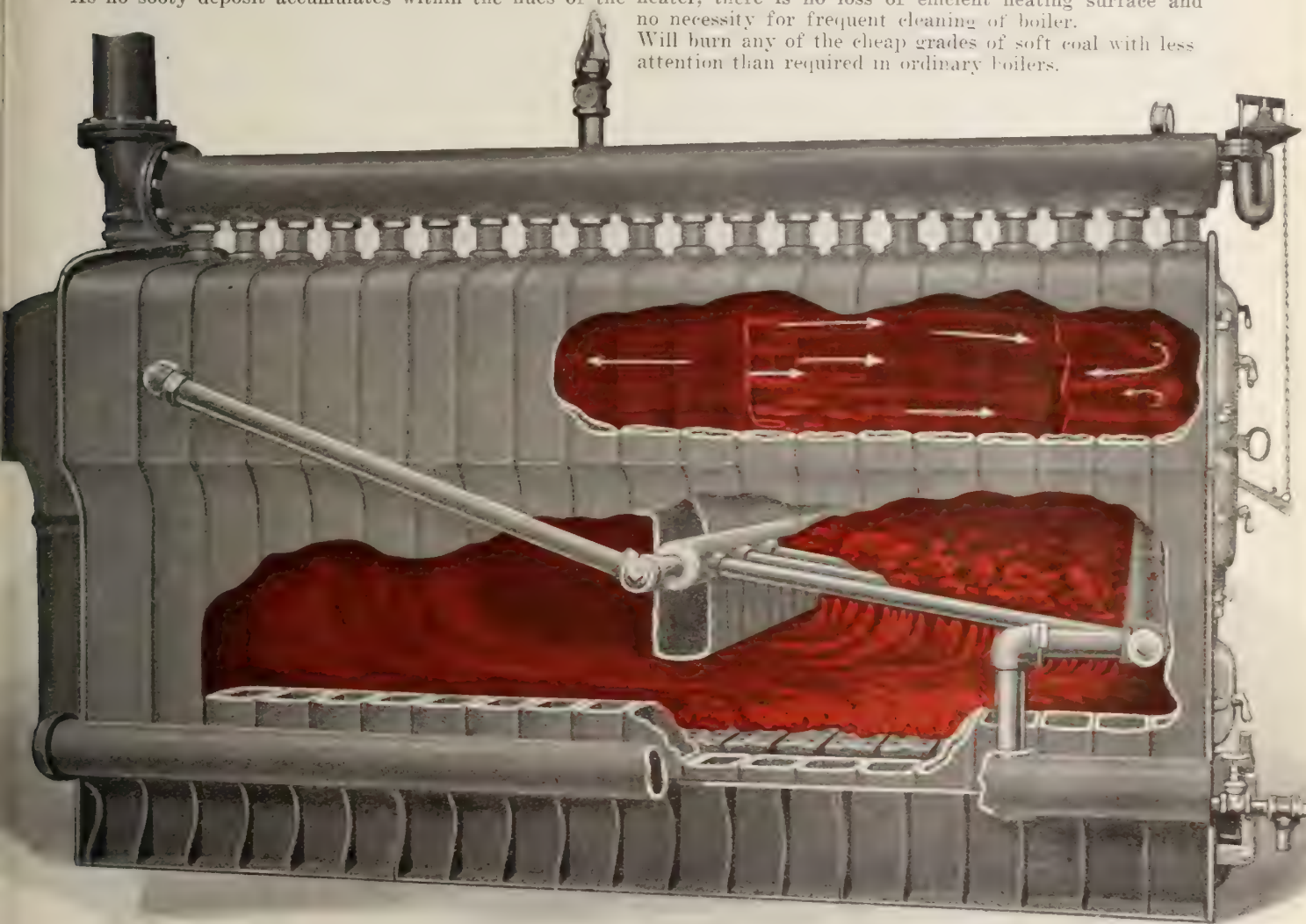
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Supply Men and Delegates at the 18th Convention

The Eighteenth Annual Convention

Full Report of Convention—Great Interest Taken in the Different Phases of Business Taken Up Which Will Prove to be a Great Help to the Trade Throughout the Whole Dominion—Ending Up With a General Feeling of Satisfaction to Each and Every Delegate Present—New Officers.

Montreal, June 10, 1913. The 18th Annual Convention of the National Association of Domestic, Sanitary and Heating Engineers opened this morning in the Technical School, 70 Sherbrooke St., West, with a goodly number of delegates in attendance.

Joseph Thibeault, president of the local Master Plumbers' Association, addressed the delegates as follows:

"Delegates and Master Plumbers of the local association of the City of Montreal, I think it is the desire of the citizens to wish you all a welcome to this city. I regret greatly that I cannot speak your beautiful language fluently enough to express myself for the citizens of Montreal; and especially the master plumbers and the wholesale people are pleased to see you amongst us for a few days. I think the master plumbers of the city will do all that is in their power to make your trip to this city as pleas-

ing as possible and if the master plumbers of the city of Montreal cannot do it I am sure that the wholesale houses are here to have an eye on them and see that they do their duty and make it pleasant for you.

"It is all well and good to have amusements and to have a good time, but there is something else, gentlemen, that you have got to look into.

In the first place I think you are here to look over very important questions and that you are here for your own interests as well as those of others, and you must see fair play for all.

"At the same time you have got to take into consideration that you are representing the most important trade among all the trades in building construction.

"I am sure that all the plumbers of Montreal as well as the engineers and architects expect from the master

plumbers of this great Dominion that we will do what is right, and that they will take what belongs to them and give to others what belongs to others.

"You gentlemen, have to see to it that in your resolutions the law is abided by and that all plumbers be qualified plumbers. In the plumbing line as in other lines, you must be careful of the men you employ under you. We have here in our city—and I think it is the same in other cities—to pass a certain examination, to pay licenses to occupy shops and to submit our plans and work to the city authorities.

"Of course I cannot speak for other cities. I know there are great and enterprising cities in the west as well as in the east and I don't think we have much to show them here, but we are gathering together every few years to see if we can improve our positions and



of the Canadian Society of Domestic, Sanitary and Heating Engineers.

to see what we can learn, from one another.

"The next thing you have got to do is to recognize the wholesale concerns, which are great protectors to our trade. And the jobbers as well.

"Sometimes these people make mistakes. It is only common sense that they, the wholesale firms, expect to get returns for whatever they sell to master plumbers, but they have to give them protection. It is like any other trade. If you want to buy a suit of clothes there is a price for the retailer and a price for the individual, it is just the same in our business. We must see that there is one price for the master plumbers and one for the public.

"This is a thing I would not like to discuss, however. This is a free country and these things must adjust themselves. Our wholesale firms are as a rule very wealthy and quite independent and I do not think it is any use for us to find fault with the way they are doing business.

"The only thing we can do is to get together. Go over the country and politely express our reasons and I have no doubt but that we will get over any difficulty in this respect. In Montreal at the present time there is little trouble

in this regard and I think it is only a question of time until the whole question is satisfactorily settled.

"The wholesaler and the jobber are not the only two classes that have to be watched in this respect, but an eye has got to be kept on the manufacturer as well, and I hope that you will get together on these things while you are here.

"It is all very well to look for protection and money in trying to build up your business and make it as large as possible, but there is another thing which is very important; it is the sanitary point.

"See that you get a good class of master plumbers, see that the rules and regulations of your cities are complied with, and by doing these things you have no idea the amount of good you can do your business.

"In the city of Montreal some years ago I may say that fifty or sixty per cent. of the houses were not fit for human habitation according to the present sanitary laws, but I must tell you that things are greatly changed now.

"I have been quite a few years in the business and I have quite a bit of knowledge about it, and I am going to tell you something in a very few words.

"A very few years ago I could count the number of baths in the city of Montreal, now I could not count the number of apartments in the city.

"I thank the master plumbers for the improvement in these things. I think the Montreal Master Plumbers' Association is the mother association of the whole Dominion of Canada. I think we are the oldest association and have worked from east to west to try and improve conditions in the different cities of the Dominion. We are not working solely for protection nor are we trying to get the largest possible returns, but we are seeing simply what can be done to improve present conditions.

"I will conclude my remarks now with an instance which I shall never forget.

"About twenty years ago we invited a distinguished doctor (Dr. Smith) to address us on sanitary points, and he said at that time that the plumbers contribute more to the health of the city than any other body, and you are the equivalent of the good doctor. For my part I am a specialist, and any place where I go I always make this inquiry first.

"Who is your plumber?"

"Gentlemen, I am only quoting the

very words of this doctor who is still living, and he declared that the first thing he did when he entered a house was to ask the master of the house who his plumber was, and then I rung this plumber up and told him how the work was done and he could judge what the sanitary condition was.

"Some years ago we used to refer to 'The plumber around the corner,' 'The robber around the corner.' Now our trade is considered just as honest as any other trade, and all that remains now is the old habit of fighting every time a customer receives a bill.

"It must be remembered that when you are called up in a great hurry and when you tear up the floor and make necessary repairs there or in the walls, that your work is hidden away, and the master of the house can never realize what has been done, therefore he always finds fault with the size of his bill.

"On the other hand when a man goes to a tailor and buys a suit of clothes. He puts it on, it fits him well and he is satisfied, and with the shoe maker it is the same thing, but I never found a man that when his closet was broken and after having it repaired that he was satisfied as a result, and as a rule declares that he wished he had never seen the old closet.

"You will now have all the necessary time to do your work and a quite a few hours in the evenings as well for leisure, but we know that the plumbers are a good class of people and that while they may be good hard workers during working hours that they can always find time for amusement."

Welcome From Wholesaler.

Mr. Baxter, representing the James Robertson Company, addressed the delegates as follows:

"As a member of the committee formed several weeks ago to arrange for your coming here, it gives me much pleasure to welcome you to our city. The supply houses have been privileged in meeting the members of your local order in committee and arranging this programme. These meetings have done us good. They have brought us closer together and I trust the result of our meetings will be acceptable to us all.

"There is a very old book which says that the 'Lion and the Lamb shall lie down together.'

"Well, certainly, the lions of the plumbing business have learned a certain amount of meekness.

"Montreal is a great prosperous, growing city and everyone is busy, with the result that many times we are maligned about our dirty streets and dirty pavements. But you also know that we hear as well from other parts of the country the crying need of quicker delivery from our factories and mills of supplies necessary for the carrying

out of the work of the country. I trust that you will be able to forget our antiquated system of ice delivery and things of that sort and that you will carry away from Montreal pleasing memories of your visit here and that you will also carry away a determination to come back to Montreal in the near future."



Badge and Clasp Worn at the Convention.

James Walsh in Chair.

James Marr, secretary, addressed the delegates as follows:—

"We will now get down to business and it is rather awkward for me that there is neither president or vice-president present at the opening of this convention, as I do not expect that Mr. Young will be present. I have also a letter from Mr. Mahoney telling me that it is impossible for him to be present. We cannot very well proceed without a president and I think our past-president,

Mr. Walsh will act, and if it is your desire I will call upon Mr. Walsh to take the chair this morning."

J. E. Walsh, Montreal, then took the chair. Lawrence Conroy was then appointed sergt. at arms.

The credential committee, consisting of Messrs. Marr, Conroy, and Frost, was then formed to receive the credentials of the delegates.

Mr. Walsh instructed the delegates to read rule 16 to see how business was conducted.

The credential committee here reported with the credentials of the delegates and Mr. John Watson moved that they be accepted and Mr. James Griffin of Montreal, accorded the motion.—Carried.

B. J. McAuley: "I understand that there are other delegates here whose credentials were not received."

G. F. Frankland, Toronto: "I have in my possession credentials for several members of the Ontario Society, but at the present time things seem to be a little muddled and until these differences are settled we do not know what to do. It seems that the report that was issued of the last annual meeting shows that the Ontario Society was affiliated at that time with the Canadian Society, the delegates of the Ontario Society still contend that we are not affiliated with the Canadian Society and until certain questions which came up at that time are settled still contend that they are not members. Whether this would be the proper time to bring this question up and have done with it, I do not know."

Mr. Walsh: "You had better proceed."

The Per Capita Tax.

Mr. Marr: "I might say for the members here that some misunderstanding has arisen between the Ontario organization and the Canadian Society. While they claim that they are not members of the Canadian Society I am under the impression that they are and I have tried to prove to Mr. Frankland that they have been since the convention at Calgary last year, members of the Canadian Society. I have on this file the application for affiliation in Mr. Frankland's own hand-writing, he being one of the delegates from Toronto, asking for that affiliation."

Mr. Marr here read the letter received from Mr. Frankland, dated July 22, 1912, asking to become affiliated with the Canadian Society beginning with the year 1913, the membership for the province of Ontario being at that time 125. Mr. Marr then referred to page 64 of last year's report where this application was put to the meeting and carried. This made the Ontario Society members of the Canadian Society.

"While some misunderstanding," said Mr. Marr, "may have arisen with dele-

gates at that convention, the facts are very clear. That report was made up by a stenographer who had no interest in our affairs and I can vouch for the reports as copied. They should be satisfied that they are really members of the Canadian Society and that they should take part in the proceedings. We do not not wish to lose Ontario from the Canadian Society. They are good workers and it would be to the very best interests of the Canadian Society that Ontario should be connected with us. I feel that if the members here would just give a little expression of what they think on the matter it might make it more clear to Mr. Frankland and other representatives from Ontario. We want to make it clear that we want them here. Convention time is the time that changes can be made and if they wish changes in the constitution this is the time to have them made. It would be in the best interests of this convention if the Ontario members would hand in their credentials and take their seats. The main cause of objection is apparently the per capita tax of \$3.00 which has been levied for this year's expenses. I do not think we will need this money. Mr. Young, our president, is unable to attend and we therefore save Mr. Young's expenses, which would be considerable, coming as he does from Calgary, and we therefore will not require the amount of money that was at first expected we would require. When we levied that amount of \$3.00 per capita. I could almost vouch that the amount per capita would not reach more than \$2.00. To those who have already paid the per capita tax we could probably make a refund. If it is possible that it might be \$2.00 we could make a refund."

Mr. Fullerton here asked the secretary to read again the letter of Mr. Frankland requesting affiliation.

Mr. Marr re-read the letter as requested.

Mr. Fullerton: "I might state that there was a delegation from Toronto last year and in levying the tax the funds that were asked for by the National Council were sent in through. Mr. Clapperton, but you will recognize that the Provincial body is largely supported by the Toronto body and most of the money is being used to organize in small towns. I only want to state that Toronto as a Society has always done its share and any deficit that it is necessary to make up, I have been instructed to assure the members that they will contribute their share. I cannot say anything further."

Mr. McAuley: "If I might be allowed to speak I think it would be well for the committee on credentials to get together and receive these credentials from the Ontario members. I think it would be a great mistake to have Ontario break

away from us because they are the largest local in Canada and certainly I should like to see them represented at our convention."

John Watson, Montreal: "Before our last meeting the executive got together and to satisfy Ontario we actually got three members from Ontario to come down to Montreal and assist us in drawing up these by-laws. All this question was gone over at that time. It was explained at that time that it was impossible to make a per capita tax of \$1.00 because the membership was not large enough to make a tax of \$1.00. As you know this tax is arrived at by an estimate of the executive committee and levied according to the estimated expenses of the convention. To my mind it would never do to make a tax of \$1.00 for one society and have that tax on the others run up to five or six dollars in order to make up the loss in Ontario. During the time I held office as secretary I had Ontario in mind very often and I wrote several letters along this same line. Whether Ontario was willing to affiliate with the Canadian Society or not makes little difference for it was our intention to go in and take towns in Ontario, but if it was their desire to come into the Canadian Society then we agreed to keep out of Ontario. We supposed that affiliation was granted, and that we had members from Ontario at our last meeting. They did not pay \$3.00 per capita tax, but they paid on thirty members and besides this there was a grant by several of the associations, and I think Toronto was one of them. This special grant was applied for at a special meeting held in Fort William. I do not think there was any question about Ontario being affiliated and I do not see how they can expect this organization to make a per capita tax of \$1.00. I cannot see that Ontario has been so badly treated, in the Canadian Society. I think, however, that Montreal has had a hard road to hoe for several years, and now that Toronto is getting a little strength I think that they should do their part and help to support the Canadian Society."

"Of course when the other provinces get the provincial associations this Canadian Society will practically come down to an executive committee because you will not need to have as many delegates attend as you have to-day. It would be a great pity if Ontario falls away from us because we look forward to their strength and I hope they will see their way clear to carry the thing out as it stands."

Mr. Frankland, Ontario: "There may be little things entering into this question that would be better to leave out, but in my opinion it is certainly desirable to have the Ontario Society affiliated with the Canadian. As I was the only delegate from Ontario to the

Canadian Convention at Calgary last year it was up to me to affiliate. This I did, but I was very explicit in delivering my instructions, that while Ontario wished to affiliate with the Canadian it was to be on the understanding that the per capita was to be \$1.00 per member from all local societies where no provincial existed. Where there are provincial associations then the locals must come under the provincial. The Ontario members believe that the Canadian Association can be run successfully as an executive body and they think that if this executive body was made up of the president from each province, or local where no provincial exists that they would be more capable in organizing different provinces, with the Canadian Society the parent organization of the whole affair."

"While it is probably true that this whole question is hinging around the \$1.00 per capita, we do not want the members to get the idea into their heads that we are not willing to meet any estimate. I want it understood that it is our desire to affiliate, but we want the per capita tax fixed at \$1.00. When the Ontario delegates received a communication from Secretary Marr that a certain amount of money was required to make up a deficit, Ontario came to the front and a circular letter was also sent out to try and make up whatever sum was necessary. This was brought up before the Toronto meeting and they said that they would be there sure, and pay their share and I also have communications from out of town members stating that they would pay their share."

"While this question comes up as to whether or not we are affiliated with the Canadian Society the delegates of the Ontario Society still believe that they are not affiliated because their request for a \$1.00 per capita tax was not complied with. I think it would be more effective if we got the provinces thoroughly organized and used the Canadian Association as the executive head."

Mr. Marr: "We cannot at the present time make any change in the constitution, but further on in the convention this suggested change by Ontario can be discussed and can probably then be carried out. Until we get so far I think there is no question about the membership of the Ontario Society. If anything may have happened to mislead the delegates at the last convention it certainly is not on record. We have nothing at all on our records that would lead us to believe that Ontario was not affiliated with our Society."

Mr. Dorman, Moncton: "In listening to letter of application from Ontario and then the statement made by Mr. Frankland they do not just coincide. Mr. Frankland tells us that they stipulated their own conditions by which they

would be affiliated with the National association. Their letter of application does not state that they will come in on a basis of \$1.00 per capita. I think the evidence is quite plain that they are affiliated, whether they have received their charter or not I do not know, but they have made application, their application has been recorded and they stand to-day a part of the body of the National association and I think that they are liable for the tax, the same as the other provinces.

"We feel in New Brunswick that while we are a new portion of the National, coming in only last year, that we had a lot of work and a lot of expense before us and while we are working and spending money our province does not intend to stop where it is, but to unite the province as a body, and while we feel sure that this will mean a pretty heavy tax we are reaping good results and that is satisfactory to us. I cannot understand how \$1.00 would meet the expenses of the National convention as it is to-day.

"While the secretary made the remark that this year's expenses would not be as large as they would have been had our president attended convention, this is something that we must provide for. We expect our president to be at the conventions, if possible, and while it may be light this year, it will be back to where it was next year and when you have to carry your members from one side of the country to another with the clerical work which is necessary some provision must be made for this, and the great drawback has always been the lack of funds. I would like to put myself on record that while we feel the tax is heavy if we can get the benefits from the National association that we feel we should get that the tax is not too heavy."

Mr. Walsh, Montreal: "I am very sorry that this situation has cropped up as it has placed both bodies in an awkward position. Last year the expenses were kept down as closely as possible and we had hoped that possibly it might be arranged so that we could get along with the \$1.00 tax. Speaking from the chair to-day I cannot say otherwise though than that you members in Ontario are affiliated with us and I think you should abide by the present rule and if you want to bring the question up further I think you should present yourselves as delegates to the convention, otherwise it would not be according to the constitution."

Mr. Frankland: "As I have said before, the evidence is against us. We will assume that up to now we have been affiliated; we will admit that we are liable for everything that the Canadian Society says. If application was accepted, then I have nothing left to do but

to put in a resignation and the Ontario members will retire from the convention, and if after the convention is over, (I am staying at the Queen's) and any further action is taken, I can be communicated with. It doesn't seem to me that any of our members should be in here when this question is taken up. As a delegate from Ontario to the last convention I had strict instructions that the affiliation was to be with the understanding of a tax of \$1.00 per member. When I reported back to the convention in Ontario last March I got strict instructions that this matter had to be adjusted this year and I do not see that I can do anything else. I was the only representative from Ontario last year, all the other members were there as local representatives. Ontario only came into being at the last convention and I was the only representative there."

Mr. Marr: "You represented Toronto."

Mr. Frankland: "No; I acted as proxy from Nova Scotia."

Mr. McAuley: "Before Mr. Frankland leaves, I understand he has the credentials of the Ontario members to place before the meeting if the report he has made is accepted by convention. He has also got authority that if per capita tax is more than \$1.00 that they are willing to share it."

Mr. Walsh: "He cannot resign until he hands in his credentials and the question should be brought up under the heading of new business."

Mr. Dorman, Moncton: "I do not think that it is right that Mr. Frankland should retire. I think the question should be settled right here. We would be very sorry to have Ontario withdraw and I think that this is the place and the time for us to settle this misunderstanding between Ontario and the Canadian Association."

Mr. Shea, Fredericton: "I am also of the opinion that this matter could be very easily settled here. I do not think they should leave at all. We have some idea in New Brunswick of what conditions are in Ontario as some of our locals are paying \$10.00 per capita in the Province. We felt last year that if we were going to have any strength we were willing to pay and it was decided at a meeting of our executive held two weeks ago not to pay this three dollar tax until we found out what benefits we were to receive. It is for this purpose that we are here to-day. It would seem to me as if this little question of a per capita tax was a side issue, but if it is necessary for the Canadian body to have that amount we feel that being affiliated with the National body throughout the Dominion that we can improve our positions, give better satisfaction to the public and receive better prices for our-

selves. This is the position we take in being here to-day. We would like to cut down this per capita tax if we could, but if it is necessary we are willing to pay it."

John Watson, Montreal: "It seems to me that the only way to get over this is for the executive committee to get together and figure out what the cost this session is going to be and reduce tax to whatever will cover that amount.

Mr. Frankland, Ontario: "This is the burning question so far as Ontario is concerned. It seems to me the work of this organization could be carried on to better effect if President Young's suggestions were followed out. Everything that is done by us in Ontario we feel is an advantage to every other province in the Dominion. Regarding the Canadian Executive we in Toronto share the same opinion as he does. In this case there would only need to be two paid representatives. The members could carry on all business by mail and any important question that came up they could hold a meeting to deal with, and the one representative of each province would be sent to the meeting at the expense of his province. This also hinges very much on question of per capita and we think that with this put into effect that the \$1.00 per capita tax would be all that was necessary."

Mr. Shea, Fredericton: "As this is a subject which is certainly one of deep interest to this convention and as it will if adopted make a change in the constitution it would be well for everyone to make any remarks they have to make now rather than to go away dissatisfied. Speaking for myself I feel justified in saying that I believe this is a step in the right direction. That it is to give us the protection we are seeking for each other. By having the business done by correspondence it will keep the different provinces in touch with one another. If they have a grievance in the West it can be referred to the Central body, and any firm that is sending men to the East we can deal with in the East on advice from the West.

"By having a system of this kind we could draw all master plumbers into our association. In some localities we have plumbers who have no regular place of business and who are doing business in wood sheds, these men are buying goods from the men who are selling us and we can do nothing with them. We cannot put restrictions on jobbing houses going out and selling goods, but we can get some protection from them if it is understood throughout the Dominion that we are united.

"As we are constituted to-day we come here and sometimes we get a lot of business done, but we do not get enough done for the amount of money we spend



1. Supply and Demand at Dominion Park; 2. Messrs. Shea, Godwin & Fullerton; 3. O. J. Delaney; 4. Collins; 5. Fullerton; 6. Supply Men; 7. Crawford; 8. Godwin; 9. Watson.

here and it seems to me that greater results would be obtained by correspondence. I know we correspond down below and we know what is going on in Halifax just as soon as anything happens. I think this is a step in the right direction."

Mr. Rowntree, Saskatchewan: "I am satisfied to see this adopted and think it would be a good thing."

Mr. Ogilvy, Montreal: "It seems to me that this will make a great deal of correspondence for the secretary if all the business of the Dominion is to be done in this way. Is the secretary going to devote all his time to this work? If we had a paid secretary to devote all his time to this work it might be a good thing. Regarding the per capita tax, I do not think that \$3.00 is too much and certainly do not think that any local association could take exception to paying the extra \$2.00. If these things are not done right they should not be done at all, and if \$3.00 is necessary, I am in favor of paying it, or \$5.00 for that matter. We have always run past our per capita tax on expenses in previous years and I have no recollection of \$1.00 that was mis-spent. If this is going to interfere with our work I would say raise it. Montreal has never made any complaint and I think that reducing the tax to \$1.00 is a mistake. I think that one paid secretary would be an improvement, but I do not see how a secretary is going to attend to all this correspondence unless he devotes his whole time to it. \$1.00 per capita tax will not pay a man who devotes all his time to the association."

Mr. Gardner, Montreal: "Secretary of Canadian Association now has to write local bodies and it would be practically the same thing. It would mean more work for the local secretaries."

Mr. Marr, Calgary: "Most of the trouble to date has been the want of correspondence. The secretary would have been too glad to have had double the correspondence he had last year."

Mr. Dorman, Moncton: "We claim that it would reduce the duties of the National secretary in as much as if the provincials were properly organized and had officers in their respective places with these secretaries in the different provinces carrying on the work in their provinces that much better results could be obtained. The provincial secretary is authorized to communicate with the national secretary instructing him of the condition of affairs existing in his province and you can see what work is being done. The Canadian body would be merely an executive head to submit matters for discussion, or to supervise the whole Dominion, that is the idea we take of it. It will bring the members of the locals in closer touch with the provin-

cials and the provincials will be doing the work that they should be doing. Now the provincials are in many provinces depending on the National. The work should be placed in the provincials and let each one work out his own case and in that way reduce the work of the National."

Mr. Ogilvy, Montreal: "How many provincial societies have we in the Dominion?"

Mr. Frankland: "We have provincials in New Brunswick, Nova Scotia, Prince Edward Island, Alberta and Ontario, and locals in Quebec and Swift Current, Saskatchewan. The duty of this body would be to organize provincials where no provincials exist. The secretary would only have to correspond with one man in each province, if there are two locals in a province they must be got together into a provincial association. At no time can there be more than nine members. In Ontario we ask the members for \$5 as a fee to provincial for the individual members and if we have to pay an additional \$3 there are many who could not very well do it. The majority of the men do not want to come over with this little sum now, we have a number of men who send in their checks regularly, but it has been a lot of hard work to keep all the members in line. I believe this is the solution of all we have been working for. In my opinion the locals should have just as much power in the Canadian as the provincials. We want it distinctly understood though that there will be only one member from each province. I do not think that this would require much change in the constitution."

Mr. Marr: "Trouble rests there. We might have three locals which could not get together. This would prohibit them from getting together."

Mr. Frankland: "Getting them together rests with the provincial officers."

Mr. Marr: "How is the president to get over the province to do this organizing?"

Mr. Frankland: "There has got to be money spent somewhere. Someone has got to be a martyr."

Mr. Marr: "I have had difficulties to get replies at all from some provinces. What would be done in cases like this?"

Mr. Frankland: "Well, I will have to go out and attend to them."

Mr. Frost: "The resolution calls for one member from each province on the executive board. If there are two associations, then only one of them could have representation on executive board. This is the point that we would have to settle."

John Watson, Montreal: "I think we are going a little astray on this thing. It does not matter whether they are locals or provincials they all must have some

representation. They are entitled to a vote for every ten members. The constitution reads they shall have a vote for every five members. I think this is a mistake, which means that they could send delegates carrying that many votes from each association. It seems to me that the locals according to this constitution, must have this representation."

Mr. McCauley, Montreal: "I do not think enough organization is being done. I think that one body consisting of nine members as a governing head would prove more effective. With them formed into a Board of Control to oversee the whole of the work in the Dominion. The secretary of this body will only have to correspond with the nine provincial secretaries and I think that in this way our work would carry more weight and do more business than is being done at the present time. The expense in connection with the central body would be much lighter and if the Dominion secretary was centrally located it would not take correspondence very long to reach him."

"The provincial secretary would be kept in touch with the happenings in the locals and then keep himself in touch with the central body. In that way, by having a general head, composed of representatives from different provinces I think more work could be done than at present."

John Watson, Montreal: "It seems strange that after spending so long last year arranging this constitution that we have got to go right to work tearing it to pieces again. Talking about the expense of this convention, when this constitution came into effect it cut the expense down about 75 per cent. Before this constitution was drawn up the Canadian Society used to pay for every provincial vice-president coming to the meeting. To cut down that expense they made only three officers to whom expenses would be allowed, the president, vice-president and secretary. Which gives this association but three members to pay for. This year, we have had to go to quite an expense in providing and getting out the annual report and by-laws, had it not been for that expense the cost of this meeting would have been hardly anything. I feel that this constitution should be given a trial, at least, it has not been in your hands yet more than two or three weeks. If any changes are to be made these changes should be put in as a notice of motion and give the members time to study out the question. I think this has come on too sudden and is not giving the members a chance to study the situation. I would like to see the constitution stand for another year."

Mr. Frankland: "In answer to Mr. Watson, I think it would stand for an-

other year anyway. This executive body can call a meeting if they want to and other members of the association can go there, but they will simply be there as guests or spectators and the executive will carry on the business. It means very few changes in the constitution, and for those few changes it would not be necessary to get out a new constitution."

Mr. Walsh: "What motion is before meeting?"

Secretary read clause one of president's report.

Mr. Walsh: "About the secretary. Is he to be a paid secretary?"

Mr. Frost: "The recommendation does not state, and I think should be referred back to the resolution committee. We are here as a society for the benefit of our profession and I think this per capita tax is taking up too much of the time of this convention."

Mr. John Watson: "As that letter reads I do not see that you can adopt that report at all. If you are going to change the by-laws you had better get to work at it. It will never do to take this as it is now. If you are going to change the by-laws you will have to form a new by-law committee. You could never get that in shape the way it is."

Mr. Marr: "Referring to this matter and the motion that has been put, I think that it would be a great mistake and too hasty. I think it needs a little consideration, and while delegates here have hardly had time to get familiar with the constitution it being so late before it got into their hands. It does not give them the opportunity they should have had. Individuals may have gone into this carefully, the majority of the delegates have not had the opportunity. I think we should let this question remain in abeyance for another year. I think it would take all that time. This question takes up a lot of the time of the convention that should meet for other purposes altogether. After spending all the time we did on this constitution last year it should at least have a year's working to see what the results would be. Results may have been the fault of the secretary this year and much greater results might be obtained a following year from a new secretary. I myself, fail to see how such could be done through a secretary. I could not continue the style of correspondence I had this year. It gets on my nerves when I write a lot of letters and receive no replies. It might be well to have this whole matter carried over for another year. We might have opportunity to discuss this in the meantime. While you are out you might think the matter over and you might come here to-morrow with a solution to this trouble."

Mr. Gardner: "I would make an



1. Messrs. Crawford, Shea, Dorman, Watson and Brunet, on Board the "Sir Hugh Allan"; 2. W. J. Crawford, St. Johns, N.B.; 3. D. J. Shea, Fredericton; 4. G. S. Dorman, Moncton, at the Technical School, Montreal.

amendment recommending that this question be referred back to the incoming officers. We could then take the matter up through the papers and probably we could do something better and we would have time to think over it."

Mr. Walsh: "Before seconding Mr. Gardner's motion I would like to ask one question. Do we require a unanimous or a two-third vote to change the constitution. I think the motion is out of order."

The amendment was seconded by Mr. Walsh.

Mr. Blyth, Ottawa: "In connection with the resolution committee's report. They simply took up the salient points in the different letters that were referred to us and which showed the business that had been brought before this association. The resolution committee did not infer that their resolution was to be made a motion but it was simply to bring the matter before the association. I expected that some member in the convention would make a motion to the effect that the association become an executive body merely and that this mo-

tion be put before the meeting at the present time."

Mr. Fullerton, Toronto: "It strikes me that the remarks of the secretary are well taken. I will move that we adjourn."

Mr. Frost: "We are here for the purpose of doing business and I would certainly like to see this convention meet to-morrow morning on the hour set down on programme. We have a lot to do and some of our members have travelled as far as 2,000 miles to attend this convention and while amusement is all very well in its place, we would like to see the business come first.

"We appreciate the efforts of the local association for our entertainment, but we come here at the request of our associations and we must have something to take back to them showing that we have been here for their interests, and I ask that you come here to-morrow, not to attend a Quaker meeting, but to talk business."

They might reduce the per capita tax alright for this year by making an estimate of what the tax will be for this season, but this will not overcome other

The Honeywell System of

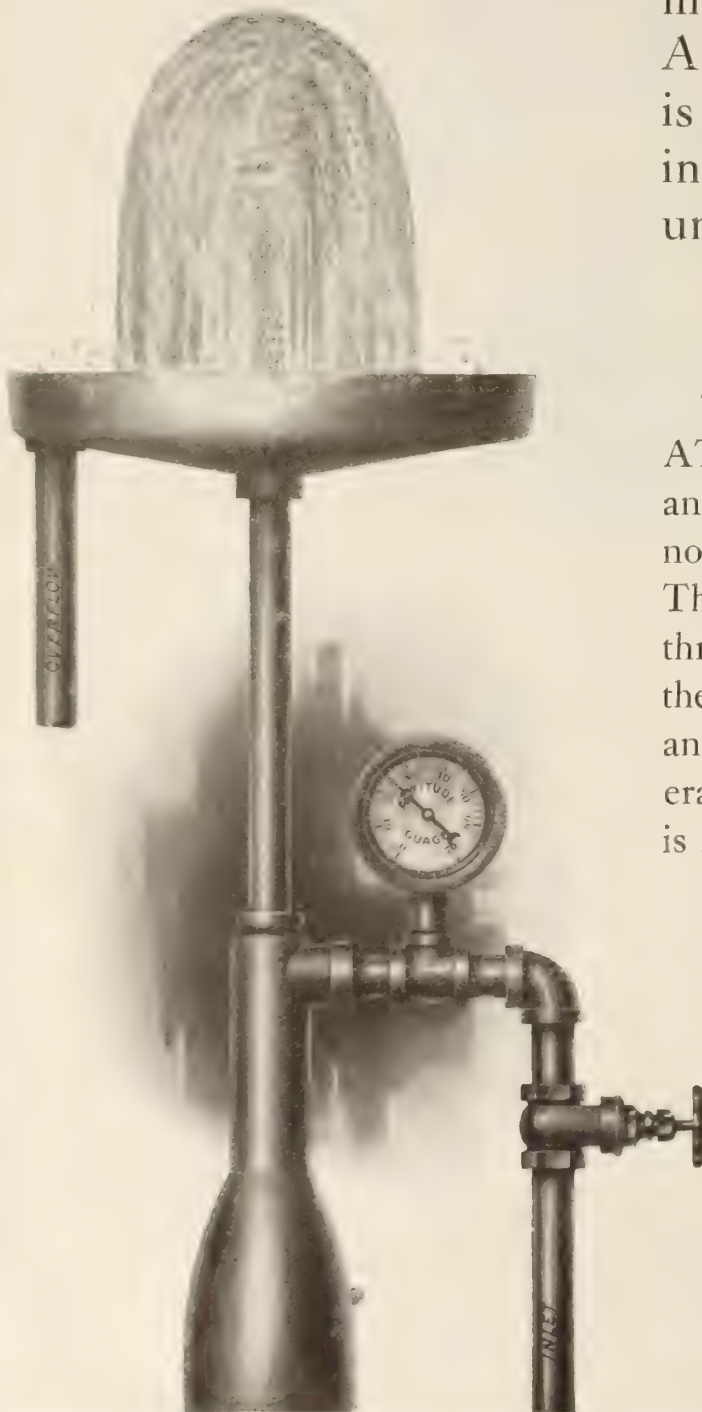
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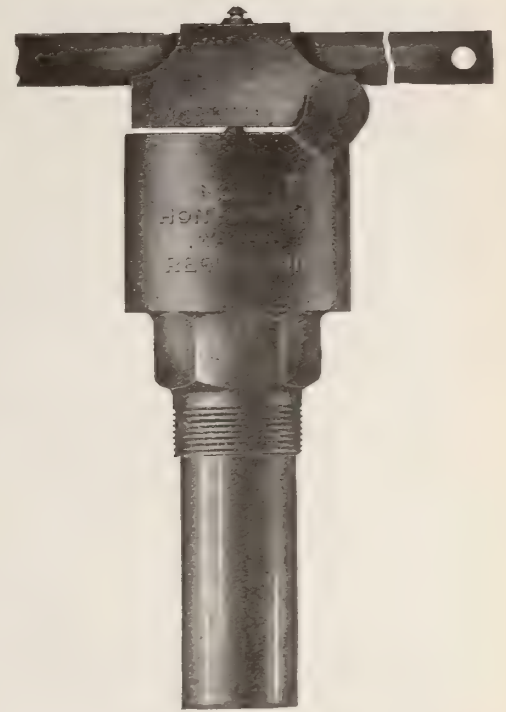
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1 & 3. Party of delegates on board the Sir Hugh Allan; 2. Messrs. Frankland & Fullerton (behind the bars); 4. Leaving for the cruise around the harbor.

points that Ontario suggests that will have to come up under the head of amended by-laws. The only way to get over the question of per capita tax is to estimate the tax and make the tax accordingly. Maybe Mr. Marr can furnish us with a rough estimate of what they will be.

Mr. Fullerton: "What was the tax for last convention?"

Mr. Wain: "That would vary. I do not think it will be very great this year. The feeling here in Montreal is that we would like to lower this per capita tax. I would ask the secretary to substitute proxies to strike this per capita tax."

Mr. John Watson, Montreal, moved that the executive get together and make estimate of cost of this convention and arrive at per capita tax, and that the vacancies from the different provinces be filled pro tem.

Seconded by Mr. Shea, Fredericton, and carried.

The executive appointed to make the estimate and deal with the above question was as follows:

Mr. McAuloy, Montreal, representing Mr. Mahoney, Guelph, Mr. Frost, Edmonton, representing Mr. Priest, Calgary. Mr. Dorman, Moncton, representing Manitoba, Mr. Roantree, Saskatche-

wan, Mr. John Watson representing British Columbia, and Mr. William Watson representing New Brunswick, Mr. Godwin representing Nova Scotia, Mr. Shea representing Prince Edward Island.

Mr. Conroy moved, seconded by Mr. Griffin, of Montreal, that this committee go into session right away.

Mr. Conroy moved and Mr. Griffin seconded the adjournment for lunch.

AFTERNOON SESSION, MAY 10.

The next order of business was the appointment of special committees, and the chairman appointed the committees

as follows:—Press, auditing, select, resolution and nomination committees.

The press committee was composed of Messrs. William Watson; Israel and Fullerton.

The auditing committee: Messrs. Roan-tree, Hainsworth and Frost.

Select committee: Messrs. Shea, Frankland, Crawford, Hughes and Godwin.

Resolution committee: Messrs. Dorman, McAuley and Blyth.

The first named on each committee to act as chairman.

Next order of business was the reading of communications, resolutions and amendments.

Jos. Lamarche, founder of this organization, in Montreal, who was present at the meeting, was invited to take a seat on the platform.

Mr. Marr: "I have not much in the shape of correspondence except a letter from Mr. Mahoney, our vice-president, expressing his regret at his inability to be with the boys in which he stated that he was detailed away from home and could not change his plans. He also declared that he would not be able to accept the office as president, should it be offered to him.

This is all the correspondence I have.

Reports of retiring officers were here taken up.

Report of President.

Calgary, June 19.

To the Officers and Members of the Canadian Society of Domestic, Sanitary and Heating Engineers.

Gentleman,—It is with great diffidence that I hereby submit my report to this 18th annual convention. I regret very much that I am unable to attend as I have been looking forward with anticipation for the last twelve months to this convention and to again have the opportunity to meet my many good friends and associates and participate in its profitable deliberations with you "Wise Men from the East."

We in the far west find it somewhat difficult to keep in close touch with association matters in the east and so cannot report as fully as we should were we more centrally located. The financial depression which seems to be general throughout the west this year is giving us some valuable experience and we have no doubt put business on a sounder and more permanent basis in the future.

It is pleasing and encouraging to note the aggressiveness and progress that the Ontario provincial society is making. The Alberta provincial has not made the same progress as yet, but has big hopes for the future. They are getting in shape I understand, and expect to get their charter from the legislature shortly. Manitoba, Saskatchewan and British Columbia seem to be as far as I can

learn doing nothing along along these lines.

I would suggest for your consideration that all these western provinces from Manitoba to British Columbia be formed into a western branch of the Canadian Society and all east of that to be the eastern branch of the Society, as distances are too great to get proper representation at any convention. Also, that the National be an executive body only, composed of a president, vice-president and secretary-treasurer of each section, to meet at the call of either section.

A movement which I particularly wish you to consider and further in the east is the getting together in convention of sanitary engineers and plumbing inspectors from every city in the east to discuss and draft uniform, model by-laws. Such a movement was set on foot in the west just after last year's convention in Calgary, by Mr. E. P. Fletcher, chief plumbing inspector for Calgary, which materialized into a very successful convention being held in Winnipeg where representative sanitary engineers, plumbers, inspectors and supply men met from every city of importance between Fort William and Port Arthur in the east and Vancouver in the west. Calgary is adopting many of the features of this uniform by-law on July 1st of this year.

This new and vigorous association has been named "Canadian Institute of Sanitary Engineers." Their next meeting is in Edmonton in April or May next. One important result was the standardization of certain materials, such as brass ferrules, lead traps, bends, pipes, etc., etc.

A committee of research was appointed and they would like data on the following:

"Plumbing material, installation, size of soil and vent pipes, examination of sanitary engineers and plumbers."

Inquiries, I believe, are now coming in from different cities for copy of our new uniform by-laws. I would urge upon you to give this new organization your hearty support. Its aims and objects being practically the same as our own. It does not in any sense conflict with the "National Association" but will prove to be a decided help.

I take the liberty to suggest that at your meeting with the manufacturers at this convention that you take up the matter of poor and leaky material supplied to the trade. Nothing is allowed for time to put this material in proper repair so that it can be used. We in the west know that these repairs amount to a considerable sum and eat into our profits for the year.

At the last annual convention of the "National Builders Exchange" held in Calgary, in February of this year, they

adopted a resolution passed at our convention in reference to foreign contractors not paying a business tax and the secretary was instructed to write all city councils regarding this matter.

Regarding the compiling of annual report which entails considerable work, I have to thank especially my two colleagues, secretary James Marr and Provincial Vice-president J. Priestley. Also all my fellow officers and members for their hearty co-operation given me during my term of office. Special thanks are also due your official organ "The Plumber, Steamfitter and Sanitary Engineer" now called "The Sanitary Engineer Plumber and Steamfitter."

Respectfully submitted,

E. J. YOUNG,

President.

Moved by Mr. Conroy, Montreal, seconded by Mr. Griffin, Montreal, that this report be handed over to the resolution committee for action.

Reports of Vice-Presidents of Provincial Societies were then read:

Report from Alberta.

The Officers and Members of the Canadian Domestic, Sanitary and Heating Engineers.

Gentlemen,—As Vice-President of the province of Alberta I beg leave to make the following report:

The past year has been fairly successful in association work. Our provincial association is still forging ahead and has increased in membership. We have not been incorporated as yet, owing to the fact that our executive board have not thought the incorporation act in existence last year was what we required, we are informed by our solicitor that amendments have been made to this act at the last sitting of the provincial legislature which he thinks will fill our requirements.

There has been one local association organized during the past year, namely, Medicine Hat.

Very encouraging reports come from the Edmonton association, they having increased their membership more than double and have now the largest local in the province. I understand they have a very strong association with all their members working in harmony and looking forward to good results for the year.

The Calgary Association has just about held its own. They have tried several times to bring the men of their craft in the city into their fold, but so far without success, but I believe they will see results from their efforts in the very near future.

There have been several business failures during the past year in the plumbing and heating trade, and it is encouraging to note that none of them were members of our association.



1. Messrs. Rountree, Frost & Marr; 2. Jos Thibeault; 3. James Marr; 4. G. F. Frankland.

Lethbridge appears to be beyond redemption. Several meetings have been called for organization purposes but there would be only two or three attend, of the faithful have given it up for a bad job.

Business throughout the province the past year has been very good and while a little quiet at present we look for it to be equally as good as the past for the balance of the year.

I wish to support the suggestion of the sub-executive in reference to the division of the society into sections of east and west. This must not be considered that the west has any quarrel with the east, but one must be a member of the sub-executive to see the small amount of interest there is taken in our society by its members. I believe a division of this kind would be for the betterment of the trade from one end of the Dominion to the other. As the distances are too great to keep the members enthused, or to get representative gatherings at our annual meetings.

I am sorry at not being able to be present with you owing to the labor trouble we are having in Calgary.

Respectfully submitted,

R. J. PRIESTLY.

Moved by Mr. Fullerton, seconded by Mr. Ogilvy, that this report be referred to resolution committee for action.

Report from New Brunswick.

St. John, N. B.,

June 6, 1913.

Gentlemen.—As Vice-President for the province of New Brunswick I beg leave

to report that as our organization is of a comparatively late date, it consequently does not admit of much history being made as to any extensive development along any of the lines which we are working on.

While some few changes have been made in the membership, yet with additions we have kept up our strength with slight increase, yet we have considerable to do to cover the whole field.

I have reason to believe that the local bodies in the chief centres carry on a vigorous campaign as far as practicable to have the trade lifted from the position in which it has so long been placed.

A new provincial health act has been enacted and some of the locals are moving the civic authorities to give effect in every way to carry out the intentions of this act.

It is expected that shortly a master plumber will be added to the provincial board, while in St. John and Fredericton a master plumber has in each case been placed on the local board. Efforts are also made to have plumbers appointed as inspectors. With these appointments made we hope to secure an enactment for the examination and registration of all engaged in plumbing work and a more thorough inspection, which heretofore could not be expected while the sale of material to all plumbers admits of work being done by indifferent workmen and questional inspection.

Referring to this point we as an organization have to look to your body to give expression strongly and effectively.

We ask no more, no less, than that the manufacturers and jobbers protect our trade as is generally done with other dealers. Failing in this all our efforts seem to be fruitless, and your crest "All for one, One for All" a vision.

At our annual and semi-annual conventions much interest has been shown by members from all points of this province and the interchange of view more or less instructive to all, tending to cultivate good fellowship and the advancement of our cause.

Successes are welcomed, difficulties also appear. These call for discretion in handling, as well as some concessions in the solving, so that on the whole our advance, while not rapid, is still encouraging. In all localities they report obstructions through the methods of business as done by manufacturers.

One other matter of interest I might refer to, viz., a communication from your secretary to apprenticeship. This has not been dealt with in such a way that a report might be made. It appears in this locality at present impossible to get boys to come under such an arrangement as proposed. It seems very difficult, even with high wages to retain them long enough to get a thorough training. The consequence is they drift about. Many start in business with scant experience and with little capital, yet the facilities to carry on work are at hand and a competition set up difficult to counteract.

The manufacturers and jobbers are largely responsible for this.

It is to be hoped that technical schools

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

may bring about a change in this if the training be taken up at an early age. As intimated to your secretary I have been prevented from being at your convention, which would have given me much pleasure, but my present position in a public capacity coming so unexpectedly, and within such a short period prevents my attendance.

I take the opportunity of suggesting one who is very active in plumbing circles, Mr. William Watson, as my successor and it will give our members much pleasure to have him received and heard in your councils.

With my best wishes for the success of your meeting, I am, dear sirs,

Yours respectfully,

George Blake.

Mr. Ogilvy moved, seconded by Mr. Griffin that report be handed to resolution committee.

Report from Quebec.

Montreal, June 8, 1913.

To the President and Members of the Canadian Society of Domestic, Sanitary and Heating Engineers:

Gentlemen,—

As provincial vice-president for the province of Quebec I very much regret that I am unable to report any great amount of work accomplished.

Owing mostly to my inability to speak the French language, I would strongly recommend, when you are recommending my successor, that he be a member who is well versed in both languages and as there are many of the members in this city who are qualified from this point of view I feel sure that you will have no difficulty in getting an officer who will accomplish a great deal more than I have done.

Yours respectfully,

A. W. GARDNER.

Mr. Charette moved and Mr. Griffin seconded motion that report be referred to resolution committee.

Report From Nova Scotia.

Halifax, N.S., June 6, 1913.

Canadian Society of Domestic, Sanitary and Heating Engineers:

Gentlemen,—

In submitting my report to the association for Halifax, N.S., although we cannot boast of increased numbers in the city we are all friendly to one another and that is worth something and shows good work for the association.

With reference to organizing in Nova Scotia, it will never be a success until some one is appointed to go through the province and get things into line. Until this is done it is practically useless to make the province a success.

We have held a number of meetings and have had some very interesting debates on the association's work.

Wishing you every success for the coming year, I beg to remain,

Yours very truly,

JAMES FARQUHAR.

Moved by Mr. Ogilvy and seconded by Mr. Blyth, Ottawa, that report be referred to resolution committee for action.

No reports were submitted from Manitoba, Saskatchewan and Prince Edward Island.

Report From Ontario.

Port Arthur, Ontario, June 7, 1913.

Canadian Society Domestic, Sanitary and Heating Engineers.

Gentlemen,—I am sorry to say that I have not been able to accomplish very much in my official capacity as provincial vice-president of Ontario during the past year, owing principally to the unsatisfactory state of affairs in our local here in the twin cities.

If it were possible it would seem to me advisable if there could be some arrangement made whereby the provincial vice-president could attend all provincial conventions and not leave the matter to chance appointment as delegates from a local to which the vice-president may belong.

Our Twin City society this year appointed two delegates to attend the provincial convention at Toronto and I regret to say failed to appoint a delegate to the National Convention now being held in Montreal, so that in this Province your provincial vice-president has not been able to attend either the provincial or the National Convention.

The Province of Ontario has done very well this year, however, having increased the membership some fifty or more since our last convention held in Calgary and we trust that the other provinces have been likewise successful.

Wishing you every success in your convention in Montreal, I beg to remain, yours respectfully,

A. G. WALTZ.

Moved by Dorman of Moncton, and seconded by Conroy of Montreal, that report be received and handed to resolution committee.

Report From B.C.

Vancouver, May 19, 1913.

James Marr, Esq.,

Calgary.

Dear Sir,—I have just received a copy of the report of the 17th convention of the society and I am pleased with the appearance of same and the general report as shown.

In connection with the work of the provincial society of British Columbia, I may say that I am not having any success in getting the various cities and towns to affiliate with us. I may say for the last two years the heating and plumbing business has been demoralized as regards organization, owing to the nu-

merous changes that have taken place throughout the province in the various towns. The country has developed so fast and so many new people have started business that it is almost impossible to keep in touch with them and hold them to any agreement, owing to the business changes being made. I may say that I have spent a lot of time in correspondence in keeping in touch with the different parts of the province, but owing to the tremendous distances and unreasonable transportation charges between the different places throughout the province I cannot get a representative meeting. However, it may come in time.

In addition to this we have had in Vancouver, especially a great influx of new shops, people coming in from all parts of the country, opening up places of business, taking up work, wherever they could get for it and then going broke. In Vancouver we have had at various times as many as a hundred shops and at any time our organization has not exceeded twenty shops out of this number. We are not trying to restrict them but want to keep up the prestige of the organization. This condition has been brought about largely through the action of some of the wholesale houses located here, they have been in the habit of selling goods to most any one and extending credits indiscriminately, the result is that owing to the general depression now on account of money matters quite a number of the people they have been supporting are failing and leaving the city, leaving debts behind them, this makes it very unsatisfactory to those who have been doing business on a legitimate basis.

I may say that now they are getting some kind of an organization and arranging it so that if a firm exceeds a certain limit of credit, which the committee belonging to the wholesale houses have allowed them, their credit is stopped and they are not allowed any more until their account has been adjusted.

In connection with our meetings, conditions are such in Vancouver that we have had difficulty in the last few months in getting sufficient members to form a quorum, but we are getting together again and are trying to keep our organization intact and hold our own during the bad times. At the present time shops that have been employing large numbers of men are employing very few and we hope now to weed out the undesirable ones from the city.

I would like you to consider this an official report from me, and assuring you that I am doing my best to hold a provincial association together, but owing to conditions which we have not had before on the coast, it makes it a very difficult matter.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Trusting to be able to report good progress before the convention, I am yours very truly.

SAMUEL WYE.

Moved by Conroy of Montreal, seconded by Charette, of Montreal, that report be accepted and handed to resolution committee.

Proceedings, Wednesday Morning,
June 11.

The next order of business was the appointment of Nomination Committee, which was named as follows: Messrs. John Watson, Frost, Skelley, Gibbons and Frankland.

Secretary's Report.

Officers and Members of the Canadian Society of Domestic, Sanitary and Heating Engineers,

Gentlemen,—In submitting my report to the 18th Annual Convention of organized effort and first under new constitution, the years 1912 and 1913 will be remembered as the years of marking time. So little has been done by this society during the year just gone by that I feel troubled as to how to make a report.

You will remember those of you who were at Calgary, how we trimmed the old ship and had her sails full set, flattering ourselves on how well she looked for the year's voyage. Alas, it takes more than sails to sail a ship, it needs wind. Well gentlemen I am just afraid that is what the old ship lacked. Although we had good officers, men capable and willing, we lacked that which would have made our voyage a good and profitable one. Could it be those other ships, the provincial associations that were blanketing the old frigate? I am inclined to think it was. They seem to catch the wind and sail away on their own course and some have made a very successful voyage.

You had placed in your hands recently a report of the 17th Annual Convention. I would like to express my thanks to the sub-executive for the very able way in which they assisted me in getting it completed. Also to those who sent in such information as was sought of them and also to the three members who kindly acknowledged receipt and expressed their opinions on the labor of your executive who had charge of this work. Nothing would have pleased me better than to have expressed thanks to all the members but under the circumstances I could not give such an expression because carelessness or indifference does not deserve any thanks. Could we by any means get the members more interested in the work, great good would accrue to all. It may be that other methods or a campaign along some tried

course other than the one by which the Society has been travelling, would be productive of greater good. Personally I am not in a position to dictate a course but surely one could be laid out and tried. I have no faith in organization by correspondence, that method is too slow, the work to be effective must be done on the ground.

Some of the provincial Vice-Presidents have been doing good work, but felt hampered in their endeavors to do more. Most of these are very busy men—men who have to provide for themselves, and no funds being at their disposal to meet the considerable expense of travelling over the province, it is not to be wondered at that more has not been done.

Vice-President Wye, of Vancouver, reports Victoria organized and New Westminster almost a sure quantity. That speaks well for him and the near approach to a Provincial Society.

Vice-President Priestly of Alberta, reports Medicine Hat organized and their prospective membership with the Province. Edmonton with an increase of twenty to their membership and Calgary a prospective ten members in addition. I expect to have the application for affiliation for Alberta in the near future.

Vice-President Blake of New Brunswick, reports his inability to attend the convention, owing to his appointment of chief engineer of the St. John fire department. I am sure the members here assembled will wish Mr. Blake every success in his new appointment and that he be long spared to enjoy the promotion as his reward for merit. Mr. Blake recommends Mr. Wm. Watson of Moncton, as his successor.

Swift Current, Saskatchewan, is the only new association that has affiliated during the year and paid their \$3 per capita tax—Five members.

Vice-President Webber of Prince Edward Island, has gone to Victoria, so that you will require to nominate some one to fill the vacancy.

In referring to the various convenors of committees I cannot say much for them, as our correspondence has been of such a meagre quantity. However, it may be that they have a pleasant surprise in store for me. If that is not so I shall be very much disappointed because I know the men have ability.

In the carrying of resolutions at last convention, providing for the various forms which were to be secured by the incoming executive, the financial part had evidently been lost sight of, as no provision was made whereby all these could be obtained. Only the most needful were secured with the money at our disposal. With regard to the Dominion directory my inquiries elicited a poor

response and I regret not having time to press this upon secretaries and provincial vice-presidents.

This covers the ground so far as my work has been carried out, the remainder of report will apply to the treasury department.

After paying the amounts voted by the convention, something like \$101 was left to carry on the work for the year, with a probable expenditure of \$485. Something had to be done if the report of last convention was to reach the members, so your sub-executive decided to call upon the manufacturers and jobbers to take space in the report.

Something like fifty-five were written to, sixteen responded with the result that the report is now in the hands of all members at a very small cost to the society. It may not be a model of such work, but you must remember that the editors were mere amateurs.

Yours respectfully,

JAMES MARR.

Mr. Conroy moved, seconded by Mr. Gardner that this report be referred to resolution committee for action.

Mr. Marr then read letter received from Mr. Legrow, president of legislature committee, the only letter received from the convenors of committees.

Legislative Committee.

Toronto, June 9, 1913.

Canadian Society of Domestic

Sanitary and Heating Engineers,

Gentlemen,—The report of your legislature committee is very brief. At the last annual convention a motion was introduced that the incoming executive be empowered to secure a dominion charter from the Dominion government before the next annual meeting. This was practically intended to instruct us to go ahead and procure the charter, but as this costs money and your committee unfortunately are all located in Toronto and away from the powers that be, we found it not advisable to incur any expense in this matter, just at this time. Your committee were also occupied with Ontario affairs, which we expected we would be relieved of, but the Ontario society thought so much of us that they refused to pass us by entirely and we felt that under their demands we should stay in office for another year, and accepting this office it left us very short of time for doing Dominion work.

We have had no matters of a legislative nature referred to us specifically and take it for granted that everything is very satisfactory.

We wish you every success in your deliberations and would ask that your new legislature committee should be ap-

pointed nearer the seat of government.

Respectfully yours,

E. LEWIS LEGROW.

Chairman L. C.

Mr. Marr: "Would like to say a word on this subject. This to my idea is the principal work of the convention. These men were given a certain amount of work to do, which was wholly in the interests of the Society, and that we should have only one report seems to me too bad. I do not know how to express myself, but when a man takes upon himself a duty, it is not forced upon him, I think the least he should do is to do a little, even if he only write a letter expressing his regret that he was unable to carry on the work.

Moved by Mr. Frankland, Ontario, seconded by Mr. Gardiner, Montreal, that report be referred to resolution committee.

Report of Committees.

President,—We are now in order for the reports of the Committees.

Mr. Shea, Fredericton: "Your committee has met and appointed Mr. Crawford of St. John, as secretary, and I would ask Mr. Crawford to read report."

Mr. Crawford: "Your committee beg leave to report that they have received and examined all letters and correspondence received and sent out by your secretary, and have found same answered promptly and kept in a very neat and careful manner.

D. J. Shea, chairman, C. J. Frankland, John E. Godwin, W. J. Crawford.

Moved by Mr. Frost of Edmonton, seconded by Mr. Gibbons of London, that report be referred to resolution committee.

Mr. Dorman, Moncton: Read the report of the Resolution Committee.

"Your resolution committee having considered the correspondence find that the following matters in order of importance require the careful consideration of this meeting.

"First, president's report—Section 1. The suggestion of the formation of a western branch; also that the National be an executive body only recommend that the suggestion of president Young that the National body be an executive body only," be adopted. That the constitution and by-laws be amended to comply with this and that the secretary of this body be located in the central part of the Dominion, this executive body to deal with all matters of importance relating to the Dominion as a whole and chiefly with our relations with the supply houses and manufacturers, and that this executive body consist of the presidents of the different provinces, who shall elect their own officers and nominate a member to rep-

resent all unorganized provincial units.

Section 2. Re western branch. If western branch, Maritime branch and Central branch are found expedient, their formation shall be subject only to the Canadian executive body.

Section 3. Re model by-laws for Dominion.

Suggest that the association take this matter up taking into account that the matter is distinctly provincial, coming under each provincial board of health, and that the Canadian executive can perform a duty in endeavoring to harmonize the legislative actions of each

Section 7. Vice-President Alberta, Priestly.

We note remarks in his report of continual neglect of organizing and the want of more interest taken by the members and would request the convention to impress the matter on their different locals generally. We note that progress has been made throughout the provinces, but not as great as might be expected. All reports from vice-presidents are on the same line.

Section 8. We also note with regret the continual reports throughout the Dominion regarding supply houses and

18th ANNUAL CONVENTION.

Held in Montreal June 10, 11, 12, '13.

Delegates Present:

MONTREAL, QUE.

Joseph Thibeault, A. Charette, Jas. Griffin, R. J. McCauley, J. R. Meadowcroft, Jno. Watson, M. J. Quigley, L. J. Conroy.

OTTAWA: J. T. Blyth—BROCKVILLE: Geo. R. Ross.

BERLIN:

Jno. Hainsworth, A. Israel.

SWIFT CURRENT, SASK.: W. B. Roantree—CALGARY: James

Marr—EDMONTON: C. R. Frost

TORONTO: G. F. Frankland, Jno. E. Fullerton.

LONDON:

J. R. Haslett, Wm. Kelly, E. H. Holland, Jno. Eggett, Alf. Gibbins, Chas. Needham, B. Noble.

MONCTON: Wm. Watson, G. S. Dorman.

FREDERICTON: D. J. Shea.

ST. JOHNS: W. J. Crawford.

HALIFAX: J. E. Godwin.

Letters of Regret at not being able to attend:—

Eli Brooks, Moncton.

A. C. Waltz, Ontario.

H. Mahoney, Guelph.

Geo. Blake, St. John's.

E. J. Young, Calgary.

province with the ultimate prospect of greater uniformity, and note with pleasure the formation of a western branch with this idea in view, but suggest that sanitary engineers and inspectors alone should be involved in this, as we cannot see where supply men are interested.

Section 4. Re quality of material.

Poor and defective material, where manufacturers or supply houses are at fault now replace the article only, no redress for lost time in replacing. Strong action must be taken in this to protect the man who instals.

Section 5. Vice-President, Quebec.

We would recommend that Mr. Gardiner's request re appointment of provincial vice-president for Quebec be adopted.

Section 6. Mr. Legrow, chairman legislature council.

We would recommend that his request for funds to provide charter be taken up at this convention and sufficient money raised to meet expenses of same.

manufacturers, not giving protection to the trade. This deserves a great deal of attention.

Section 9. We note in secretaries' reports with pleasure the advance being made in the Western provinces, but regret the dilatory action of officers in not keeping in touch with the secretary and assisting him in his work.

Section 10. In reference to taxing foreign contractors. We note builders' exchange in convention in Calgary in 1913 had adopted a resolution passed at our last convention, in connection with this matter. Would recommend that our secretary write the secretary of Builders' Exchange to note results.

Section 11, Re Mr. Blakes' report.

We would suggest where possible that a qualified master plumber be placed on all provincial and local Boards of Health.

Respectfully submitted,

George S. Dorman, R. J. McCauley, J. T. Blyth.

Mr. Dorman, Moncton: "I would recommend and make a motion that report be taken up and discussed clause by clause seconded by Mr. Frost."

Mr. Frost in Chair.

Mr. Frankland moved the adoption of clause one of President Young's report,

that this first clause relating to the executive body be referred over until a later meeting of the association, and I would make this in the form of a motion."

Mr. Crawford, St. John, seconded the motion.

NEW OFFICERS APPOINTED

For Year 1914.

President:

Jno. McKinley, Ottawa.

Vice-President:

Jno. Watson, Montreal.

Secretary-Treasurer:

E. C. P. Holloway, Ottawa.

Provincial Vice-Presidents:

ALBERTA: E. McKnight, Edmonton.

BRITISH COLUMBIA: J. S. Anderson, Vancouver.

NEW BRUNSWICK: G. S. Dorman, Moncton.

P. E. I.: B. Shaw, Charlottetown.

NOVA SCOTIA: J. E. Godwin, Halifax.

QUEBEC: Jno. Gordon.

ONTARIO: F. R. Maxwell, Toronto.

MANITOBA: A. J. Hammond, Winnipeg.

SASKATCHEWAN: N. B. Roantree, Swift Current.

Chairmen of Committees:

SANITARY: Jas. Marr, Calgary.

HEATING: R. J. McCauley, Montreal.

LEGISLATIVE: J. T. Blyth, Ottawa.

APPRENTICESHIP: G. C. Crawford, St. John's, N. B.

ESSAY: Jas. E. Walsh, Montreal.

after it had been read, and this was seconded by Mr. Geo. Ross, Brockville.

Mr. Frost: "This is a question which is the hinging point of our association and I would like to hear every one in the room discuss it. We are here from the West in the minority, but I would like to have an expression of opinion from all quarters. We want to make our association as effective as possible, but we want to cut down the cost of our conventions and it seems to me that this is the most feasible way of doing it. This is an important question and we must not settle it by a Quaker meeting."

THURSDAY MORNING, JUNE 12.

Mr. Frost in chair.

Mr. Gardner moved, seconded by Mr. Shea, that minutes be accepted as read.

Mr. Frost: "It has been suggested that the first recommendation of the resolution committee be left over until a little later in the morning. It is a very heavy matter, and it is thought that it would be as well to take up the other recommendations so as not to devote all the time to one and then have to railroad the other business at the close of the convention."

Mr. Dorman, Moncton: "As chairman of the resolution committee I would ask

Mr. Dorman, Moncton: "The second clause is practically relating to the first, and I think that it should lay over as well. Clause 2 reads as follows: Re Western branch. If Western branch, Maritime branch and Central branch are found expedient their formation shall be subject only to the Canadian executive body. I think we would have to stop over this until the first clause is settled."

Mr. Gardner moved, seconded by Mr. Conroy, that this question be referred over to the incoming executive.

Mr. Dorman read clause 3, re model by-laws for the Dominion.

Mr. Gardner: "Re model by-laws for the Dominion, I would suggest that the association take this matter up, taking into account that the matter is distinctly provincial, coming under each provincial board of health, and I believe that the Canadian executive can perform a duty by agitating for greater uniformity. I would move that this section be accepted as read."

Mr. Frost: "That is a recommendation from this body to the provincial association."

Mr. Gardner, Montreal: "I would move, then, that section 3 be brought to the attention of the incoming executive

and placed before the different provincial."

Mr. Charette, Montreal, seconded the motion.

Mr. Dorman, Moncton: "Considerable of this is going to be awkward as a result of the unsettled state of the first resolutions. We note with pleasure the formation of a Western branch with this idea in view, but suggest that sanitary engineers and inspectors alone should be involved in this, as we cannot see where the supply men are interested. I do not know what action should be taken on this."

(To be continued in next issue.)



BANQUET TENDERED TO DELEGATES.

A very pleasing event of the Convention was the sumptuous repast provided by the plumbing supply houses of Canada. The different representatives were present, and did all in their power to cater to the comforts of those present. Their part as hosts of the repast was beyond comment. Quite a large number of members brought their good ladies, who also added popularity to the dinner by their presence. At the close one and all went on their way rejoicing to their several homes in all parts of the Dominion feeling that the Convention had been a power for good to the trade and had come to a very favorable ending. Following is menu:—

SOUP	
Beef Broth a La Canada Tube	
FISH	
N. P. Boiled Cod	Ideal Sauce
ENTREE	
Standard Lamb Chops a La Soubise	Pomme Payette
ROAST	
Prime Ribs of Beef Au Twyford	
Carrots in Solder	Smudge Potatoes
DESSERT	
Canada Steel Pudding	Trenton Sauce
Jenkins' Cheese	Robertson's Crackers
Ice Cream a La Mott	
Coffee in Ladies	

TRIP AROUND CITY.

At 4 p.m. the delegates left the convention hall in cabs driving to the foot of Cote street where they boarded two special cars for the trip around the city. The cars left sharply on time and the first special was filled with ladies and their escorts. The party was in a jovial humor and every little while their spirits would burst forth into song and whenever a green field was sighted this inclination to sing seemed to be

greatly enhanced and the melody which was poured forth was like unto the first warblings of a lark. To say that it was beautiful is putting it too mildly—it was really entrancing and held the hearer spell-bound until the last echo of the song died away.

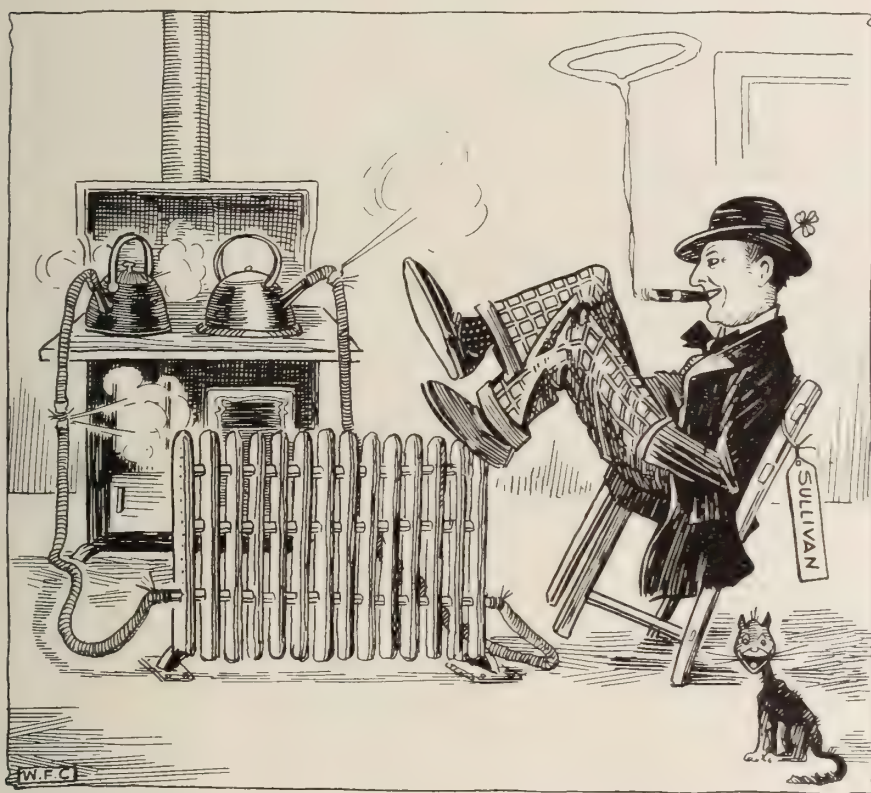
The trip was through the busy sections of the city and on out into the newer sections where the growth of Montreal is more clearly demonstrated by the vast rows of houses now in course of

construction. The trip around old Mount Royal is a beautiful one as the iron pathway is laid amid the finest scenery in this section of the country and indeed it is hard to equal the grandeur of the majestic mountain in any other section. After leaving the outskirts of the city the cars swooped down again upon the busy thoroughfare and travelling along St. Catherine street the party arrived at Dominion park at 6 p.m. in a very hungry condition.

Convention Side Lights

Pat was feeling the effect of the coal bill at his purse more than at his hide. So took the liberty to connect himself to an old radiator he saw lying at the rear of a building being pulled down.

"And how do you get that thing?" asks Pat. "Why, Pat, don't you know all about dat fairy tale of the Scotchman what found steam coming out of a kettle and got a licking for it?"



A perfect job of heating discussed at the Convention recently.

"Bedad," says he to himself, "here's where I get heat wid-out the blamed pot-stove." So he carried it home and put it up by the kitchen range. But Pat got no heat. "Phwat's the trouble wid the darn't ting any way?" Next day he met a mate of his who had heard the woes of Pat. "Say Mike," says he, "you know more about this heat business seeing your hair is red." "Red face and always in a stew," says Mike.

"What you want is some steam in it." "Begorra, Mike, here's me for some heat." And off he went. And here he is above enjoying solid comfort, perfect circulation and a steady job fixing leaks. Echoes from Room 381, Windsor Hotel.

Rawley tried to sell Pat a Honeywell heat generator and nearly got a black eye because Pat got the impression that he was the heat generator and was not in for any competition.

Delaney was the one who handed out the whiffs and quiffs. Some say he's a "Corker." That means he's Irish, bedad; but if so, why did he claim to be of Franco-German descent at the Convention?



Ripping was the time we spent
At Montreal Convention,
Where each one on pleasure bent, with
Loads of good intention.
Each enjoyed great chunks of folly;
Yes. And Thanks to F. T. Rawley.

Possibly some of the boys don't know Rawley. Well, did your troubles ever get hitched up with a bum job of heating. Don't worry or cuss, but just unhitch it.

Then just stick in a Honeywell.
You'll find you've spent your money
well.

Your bum jobs will have gone to—
Nuf Sed.



IN LIGHTER VEINS.

One of the results of neither smoke or water tests which proved too strong for that particular job of roughing in.



View of group of delegates and friends who were partakers of the dinner given at the Dominion Bank by the supply men at the 18th annual convention held in Montreal recently.

BOWLING TOURNAMENT.

Western vs. Eastern.

The Bowling Tournament, Western vs. Eastern, was a great feature in the sports. It was held at The "Club Canadian," through the courtesy of Joseph Thibeault, who is a member of the Club and was also a delegate of the Montreal branch of The Canadian Society of Domestic Sanitary and Heating Engineers. His presence, too, caused the feeling of the "sports" to radiate in such a way that while there was a Frost present, no chilling effects were experienced by any. Some of the bowlers, both East and West, were enthusiastic winners and made good scores. Several times during the progress of the game it was hard to foresee which would be the winners. Though the Western came out on top by a majority of 129.

Western.		Eastern.	
I.		I.	
Mac	124	Watson	113
Frost	74	Conroy	125
Howes	117	Ogilvie	108
Dunn	127	Quizley	133
Total	462	Total	479
II.		II.	
Laidlaw	153	Delaney	96
Ross	118	Dansereau	59
Gibbons	83	Kelly	112
Blair	69	Sadler	74
Total	423	Total	341
III.		III.	
Hamsworth	82	Shea	120
Jermel	127	Godwin	78
Blair	153	Crawford	92

Fullerton	89	Dorman	88
Total	471	Total	387
Total	1,336	Total	1,207
In favor of Western team	129		

BOWLING TOURNAMENT.

Travellers.

At Club Canadien.

Eastern Team.

Hamel (Steel and Rad.)	146
Lalonde (Steel and Rad.)	139
Tessier (Warden King)	133
Rheum (Dom. Rad.)	97
	515

Western Team.

West (Steel Co. of Canada)	115
Barchard (Warden King)	81
Laidlaw (Warden King)	146
Dunn (Colwell Lead Co.)	147
	489

Eastern came out winners by 26 bowls.

Bowling Score—Supply Men.

J. Brunet, pres. Bldrs.' Exchange ..	87
J. Lamarche, ex-pres. of Master Plumbers' Association	79
Mr. Masse, of the Harbor Commissioners	82
J. Laurier, ex-pres. Association	121
H. Tobbiner, Twyford's, Ltd.	64
Mr. Evans	136
A Robertson, Jas. Robertson & Co., Ltd.	86
Mr. Smallpiece, Taylor-Forbes	156
W. J. Hall, Mott Co., Ltd.	129
P. Ogilvie, of Ogilvie Bros.	100

APPOINTED FIRE CHIEF.

Geo. Blake of St. John's, N. B., has been appointed Fire Chief of that city. All sanitary engineers wish him every success in his undertaking.

OPEN A BRANCH.

Bredenbury, Sask.—Messrs. Frost & Co. of Yorkton, have opened a branch plumbing shop in the building east of Bredenbury House. They have discontinued their branch in Saskatoon.

A LIVE ASSOCIATION.

Though made up of only eight or ten masters, the Brantford Association are a live body and are getting right down to business. Two propositions are now up before them, namely: the compiling of a retail price list and the drafting of a new plumbing by-law for that city. On the latter a committee made up of two journeymen and two masters, A. Tipper, and J. Anguish, are now working. When these get the matter thrashed out they intend submitting their decision to the city engineer and a committee of three from the council. These will make any amendments necessary and then hand the matter over to the council to pass upon.

The by-law as it now reads, is claimed by some to be all O.K. if only it were carried out. The intention, however, is to cut out all unnecessary clauses, insert all rulings which lately have been taken for granted, though unwritten, and altogether make a more modern by-law which will benefit the consumer and master alike.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atatek, London, Eng.

John Bayne MacLean, - *President*

J. G. Lorrimer, - - - *Manager*

Edward Newsome, - - - *Editor*

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, JUNE 16, 1913

The Montreal Convention

THIS Convention was one never to be forgotten from many points of view. There being present delegates from Montreal, Ottawa, Brockville, Halifax, Toronto, Calgary, Edmonton, Swift Current, Saskatchewan and Berlin. It was a meeting of men who came to do business in no small way, and great interest was shown by all who were present. There was no lack of discussion and it would be hard to find a single phrase of the Sanitary Business that was not taken up. It was full of food for reflection from start to finish. Misunderstandings were aired, conclusions were arrived at in a most brotherly manner and all came to the city of Montreal with a feeling that they had a business to discuss of no mean order. They realized too that, while pleasure was to be one feature, business was predominant and in that spirit they got down to the business of the convention in good shape. There was a largeness of heart too shown as each delegate brought out the differences of opinion on one line or another and all seemed to feel that they were there for the common good of one and all.

Such conventions are only too seldom held, but the "Sanitary Engineer" can assure its readers that the 18th Annual Convention held in Montreal will be echoed throughout its issues until the heralding of the next convention to be held in 1914 is heard.



The Uplift Movement

ONE CANNOT help commenting at length on the fine food for thought given out by the different delegates from all parts of our Fair Dominion. Her people at large have not the slightest idea how interested each and everyone was for the welfare of the people of Canada. While the methods of business transactions exclusive to the Sanitary Heating and Ventilating line were largely discussed, they were all as a means to an end so that the whole craft throughout the country would be placed to better advantage to give a fair Square Deal to every one. As to the importance of the Trade and Calling of the Sanitary Engineer, there is not the slightest doubt. Conditions were aired in no mean small way, but rather with a spirit of broad liberal mindedness. The craft is laboring under great difficulties, all of great importance and all which are

a drag in the uplifting trend which the trade is anxious to make. The public at large have not been educated to the fact as to the importance of the craft, and until then, we have a great prejudice to outline. It will need strong minded men, men who are ready to be attacked by some of the public in more ways than one. We must be strong and live down this prejudice in a gentlemanly manner. This is the beginning of a **New Era** and the sentiments voiced at this 18th convention were fine and brotherly. They breathe great hopes for the future of our craft. Those who were present could not help seeing, through all the debates and motions discussed, that a large-heartedness existed and that the chief object in view was a strengthening of the body as a whole and the lifting up of the craft from the position it seems to hold in the public's eye. It voiced a feeling that it wanted more efficiency in its general make-up so as to be in a position to earn and hold the position which is really belonging to the trade, a position which no other craft can or ever will aspire to. The very fact that we stand for improving the conditions, comforts and general make-up of our civilized world is no mean position to hold then let us hold it in a dignified way. The cheap jack, or as he was called **The Curbstone Plumber** is not one of our order. While he may try the trade for a short period, he will not and cannot compete very long with those who have the trade at heart. How many jobs are given to such of those which are a source of revenue to the craft on account of those who do the good work being afterwards called in to put matters right? While the **Curbstone Plumber** is a "thorn in the side" to the trade, he will soon be a thing of the past if we can have a few more such conventions as the one just over. Then amongst the rest of the craft which are and have been in the trade all their lives, such conventions are a power for good. Could one imagine any of those present cutting the throat of the other fellow? After the way things were taken up, we want competition, because it is the life of trade. But we want unity and are on the verge of getting it. We know full well that, when two first-class men send in their estimates on a given specified job, their prices cannot be far from each other, and it then comes down to the reputation of the parties who are tendering which closes the job. So let us see to it that we give out the same feeling to our customers and the general public that was so prominent at this convention and our position will be the most enviable of any other line of calling.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

RANGE CONNECTIONS OF TWO STOVES.

Editor, Sanitary Engineer.—Will you kindly give some information on this job of range boiler work. Enclosed sketch of range and boiler connected up in the usual way; then boiler in basement connected with coil in hot water furnace and with a coil in stove. But my customer wants to use the whole three in winter, but only the one in the basement in summer. Shall I put a stop cock on the hot water pipe in the kitchen so that the cold water will not go into the piping from the boiler in the basement?—Mack.

We herewith submit piping of job you asked for. But do not use any check valve on the system. The main water supply will take care of the expansion, whatever it may be; and, as there is no circulation between the two boilers, you will have no trouble with the boiler alone. Be sure and drill a hole about 3-16 in the water tube on cold water supply to each boiler; and if you wish to be sure about the hole not rusting up, tin the hole where the drill has gone through. It will surely rust if that is not done. You might put stopcock on hot water in kitchen near where this pipe enters the boiler, but we think if you just close the stopcock on cold that would be all that is necessary when the kitchen boiler is not in use in summer time. Editor.

WHY THE BOILER DOESN'T FIRE EASILY.

Editor, Sanitary Engineer.—We had a steam job put in last winter, and it worked all right up to the present. In the recent cold weather it became necessary to start the fire once more, and, to my surprise, it took several hours to get up steam enough to warm the house. The boiler seemed not to want to make steam, although I put in plenty of fuel. It is a good boiler and a good job. Now can you suggest the cause of jobs acting this way the very first season they have been in use?—A Reader.

We assume that you let the fire out of the boiler for several days and then wanted the heat quickly. You must remember that all of the water was cold,

and that it was just the same as if you were starting the job for the first time. It was probably worse, for we see nothing in your letter about the boilers having been cleaned out. If you look into the matter you will probably find out that the flues are badly stopped up, and that the smoke pipe is partly filled up with soot and ashes. If you give the boiler and chimney a most thorough cleaning out and put some fresh water into the boiler, you will find out that the boiler will make steam so quickly that you will be surprised. There is no reason why it should not do as well as when it was first started. In this early spring weather it is just as well to keep a little fire in the boiler. A hod of coal will run the fire a week, if rightly banked, and keep the water in the boiler warm. Then, when you want a little fire in the evening you can get results quickly.—Editor.

HEATING 30 GAL. BOILER.

Editor Sanitary Engineer.—Will you please tell me how many feet of 3-4 pipe made into a coil will satisfactorily heat a 30 gallon range boiler. R. McK.

It depends a little on how far the

ordinary sized house where, say, 4 to 6 persons are using hot water, and the coil is used in a range instead of a water front, we would say about 6 ft. of 3-4 pipe would be sufficient.—Editor.

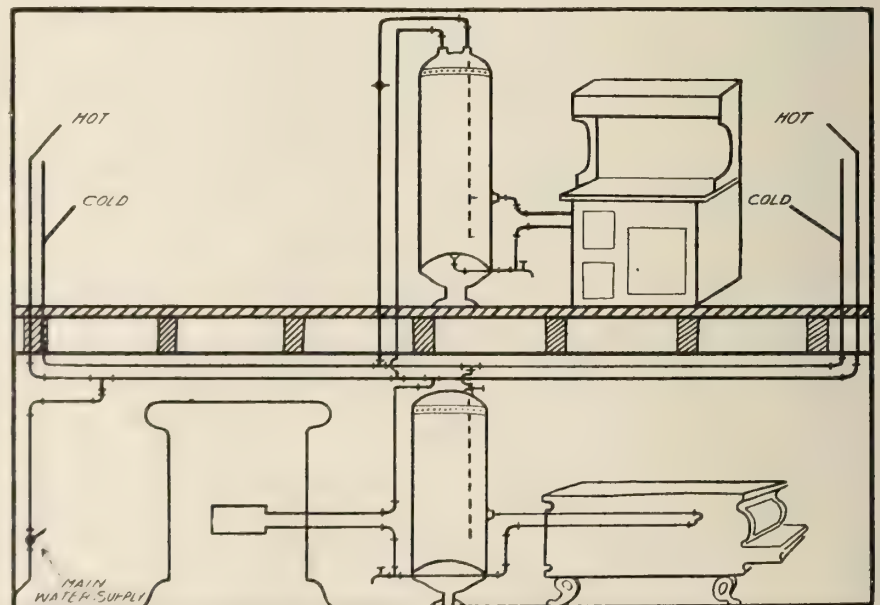
SET RADIATORS FARTHER AWAY FROM THE WALL.

Editor, Sanitary Engineer.—How can the radiators be prevented from discoloring the walls?—J. I. C.

One way is to make use of radiator shields. Another is to set the radiator farther away from the wall, as shown in Figure 3, a distance of at least three inches. This will enable the housewife to get behind the radiator and do some cleaning. Bronze or paint the back loops of the radiator, as it will prevent rusting, and also make the cleaning much easier.—Editor.

EXPANSION TANK CONNECTIONS.

Editor, Sanitary Engineer.—A hot water heating plant has two separate mains leading in opposite ways from the boiler, and one of the runs is 50 feet, while the other is 70 feet in length. Now the question is, where



boiler is from fire; also what shape of coil is to be made and how much hot water is to be required. But for the

should the pipe to the expansion tank be run from to get the best results?—A Fitter.

It might be connected into the return pipe of the radiator nearest to it on the second floor, but we believe that it would be more desirable to run a separate pipe from the expansion tank to the boiler without any consideration of the radiator connection mentioned.—Editor.

STEAM TRAP CATALOGUES.

Editor, Sanitary Engineer,—I desire to get more information in regard to steam traps, and wish to get hold of some catalogues on the subject, but do not know just where to write to get them. Will you please give me the required help?—Information.

You have undoubtedly had some experience in dealing with jobbers. Now write to the one that has given you the best satisfaction and tell him just what you are looking for. He will probably send you several catalogues. You can also consult the advertising pages of this paper and write to the manufacturers of steam heating specialties, who, we are sure, will be glad to give you all the assistance in their power.—Editor.

THE DIES SPOIL THE BRASS PIPE.

Editor, Sanitary Engineer,—Every time that I go to cut a thread on a piece of brass pipe, the dies that will cut a perfect thread on iron pipe will practically ruin the brass pipe, tearing the threads all to pieces. What can I do about the matter so as to get good threads on the brass pipe?—A. L. D.

To cut good threads on brass pipe requires a set of dies with a somewhat different "rake" than the dies that are used for cutting threads on iron pipe. You can slightly grind a set of dies and save them for cutting on brass pipe only, and we are of the opinion that this will pay you if you have much brass pipe to thread.—Editor.

A STEAM JOB ON THE CIRCUIT PLAN.

Editor, Sanitary Engineer,—Will you give me a plain lay-out of a steam job on what is called the circuit system, and thus oblige one of your readers?.. Helper.

In Figure 2 we show such a system and have applied about all of the information to the drawing itself. On this job the highest point of the steam main would be directly over the boiler.—Editor.

AN EASY 45 DEGREE MEASUREMENT.

Editor, Sanitary Engineer,—Please tell me a rule that will enable me to measure 45 degree measurements, and do it reasonably correct every time. I am tired of squinting over a ruler and

getting the work wrong half the time.—G. H.

We show a diagram in Figure 1, which will more clearly explain our rule. Suppose that you have a 12-inch offset and wish to use 45 degree ells. Desiring to know how long to cut the pipe between the two 45 ells, you can follow

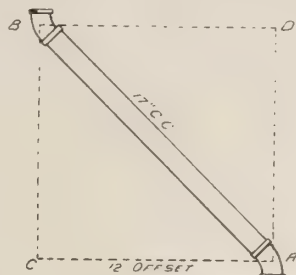


Figure 1.

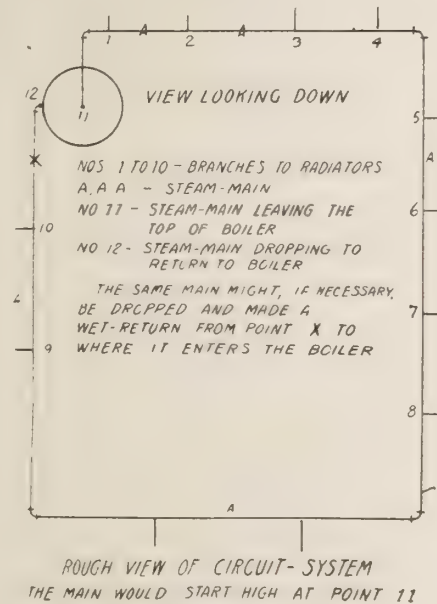


Figure 2.

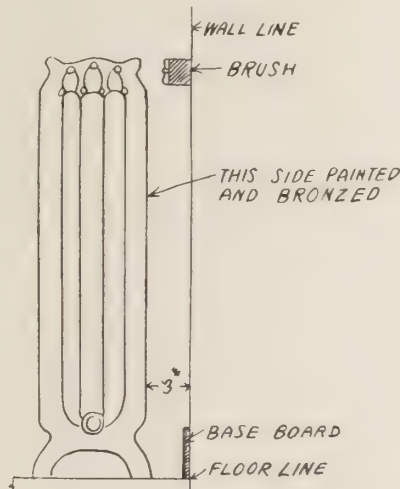


Figure 3.

this rule, and be sure that the work will come out reasonably accurate. Multiply the offset in inches by 17, and divide the product by 12. Take out whatever allowance must be made for the fittings, and the resulting distance is the correct length of the required

pipe in inches, or the distance from A to B, which would be 17 inches, as it is shown on the diagram.—Editor.

BE FAIR TO THE HELPER.

Editor, Sanitary Engineer,—Am working as a helper in a shop, but I do not seem to make as much progress as would seem possible. Also the wages are small. Has a helper any rights at all?—Helper.

You bet he has. It is the helpers that are going to be the future journeymen, and, some of them, sanitary engineers. The helper has the right to expect wages according to the services he renders. If he is faithful, works steadily, and is steady, he has the right to expect a certain amount of definite instruction. If he is held back he should quit and go to some shop where he will be better treated. He also is entitled to receive his pay promptly and regularly. He should not be expected to do a journeyman's work for a helper's pay, as some masters seem to expect. We hope that these few points will help you out.—Editor.

ELEVATING WATER BY STEAM TRAP.

Editor, Sanitary Engineer,—Please tell me how much steam and how far per pound the steam will lift the water.—Fred H. Buell.

About a pound and one-quarter of steam will raise water approximately two feet, according to the tests of some persons who have made the observation while using steam traps, we are told.—Editor.

WHY USE THE STREET ELL?

Editor, Sanitary Engineer,—Is there any excuse for that fitting which is called the "street ell"?—Plumber.

Yes, if you haven't the necessary short nipples or the time to cut them when you are out on a job and are called upon to put in some work in close quarters, they come in very handy. From the sour tone in your question we assume that you have been bothered by leaks from street ells. This need not occur if you take a little pains in sorting the bad ells out.—Editor.

PRESSURE ON TANK.

Editor, Sanitary Engineer,—"Kindly inform me through your paper the pressure on each side of a tank six feet square filled with water and how much on the bottom. Is there as much pressure on the top half as the bottom half.—S. E. S."

The pressure of still water in lbs. against the sides of any vessel of any size per square inch is equal in all directions. To find the pressure in lbs. per square inch multiply the height of the water in feet by .433.—Editor.

Setting and Connecting Range Boilers

By PHOENIX

CHAPTER II.

Before going farther with the subject, it might be well to bunch some of the points noted and to add a few that seem to be practical value. It will be a lot of boiled down information that can be kept in some place for hasty reference when needed.

1. In all range boiler installations the use of half-inch pipe is not desirable.

2. The distance between the range boiler and the water front should be as short as is possible. This distance can be as great as 100 feet, however, if proper precautions be taken, such as reaming the pipes, the pitching of the pipes, and elevating the boiler higher than ordinarily.

3. When one must choose between using a 30 or a 40 gallon boiler, it would be the better practice, generally, to use the larger size. This same practice will apply to other sizes not being limited to the two sizes quoted.

4. Hot water naturally rises. Remember this fact and do not set the range boiler too low in relation to the position of the water front.

5. The connecting pipes between the range boiler and the water front as shown by pipes numbered, "7, 8, 9, 10 and 6, 5, 3," should be run with the fewest possible number of turns. Instead of making right angle turns as just shown, 45 degree ells would do the work after a much better fashion and be a much more practical looking job into the bargain.

6. The pipes mentioned should be of galvanized iron perfectly smooth on the inside, well reamed, and not less than three-quarters of an inch in size. Some plumbers always make the boiler and front connections of one-inch pipe.

7. To avoid any danger from siphonage, the end of the cold water tube that is placed inside of the boiler should be kept about two inches above the actual level of the water back.

8. The safety hole in this cold water tube (shown by point "24") should, ordinarily, be some one-eighth of an inch in diameter. It is easily made by filing a notch and then ramming the hole through by a pin.

9. Do not reduce the size of this tube smaller than the size of the supplying cold water pipe to the range boiler.

10. Some plumbers consider that a vacuum valve is safer, in the long run, than the hole punched at point "24."

11. The location of the aforesaid va-

uum valve should be at the point in the illustration marked "12." This would be the highest point of the siphon as applied to this particular job. By using this vacuum valve no hole in the drop tube inside the boiler is necessary.

12. At points "19" and "20" in the drawing union couplings are shown. Many times the gaskets in these unions

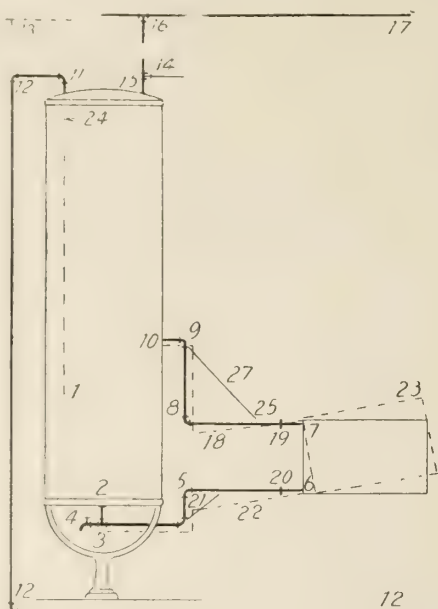


Fig. 1.—The range boiler and its connections.

are made of rubber. Lead gaskets will last longer; but unions requiring no gaskets at all are preferable.

13. It is a mistake to put a check valve on the cold water supply pipe, for the purpose of attempting to make the circulation go where you desire. There are better and far safer ways than that. The hot water might better back up into and ruin the water meter, than to cut off the chance of the waters expanding and causing an explosion that might ruin property and possibly cause a loss of life.

14. The water front, or back, should be set level. Test the point with a true level in order to be perfectly sure. If the front is untrue it will pocket air and give no end of trouble.

15. A pocket level is a good thing to carry. There are lots of pipes on a plumbing job that ought to be levelled, but they never are and consequently many jobs pocket air much to the surprise of the plumber who does the work.

16. Many times a pipe coil is used in the place of the commercial water back. In some instances it is possible to get more heating surface in the pipe coil than can be got by using the water back.

17. When it is desired to use a coil for such purposes be sure and specially select the pipe. The inside should be perfectly free from all obstructions, well reamed, and the threads cut with more than the usual precision. Many plumbers have the notion that copper pipe, when used for heating purposes in a coil will never stop. Careful tests have shown that copper pipe will stop up just the same, and if anything, even quicker than galvanized iron pipe.

18. The size of the pipe for this heating coil should be at least as large as the connecting pipes between the coil and the range boiler. The coil can be of larger size pipes, but never of smaller. Return bends can be used at the ends of the coil, although close nipples and ells are practical and many times used.

19. In setting the range boiler it is sometimes placed too low with regard to its relation to the water front. It has been noticed that such an installation cuts off the capacity of the range boiler inasmuch as it reduces the hot water capacity, and may do it to such an extent as to render the boiler practically useless as far as furnishing hot water is concerned.

20. If the pipes from point "6" to point "3" could be run in a straight line it would be all the better for the working of the job.

21. Sometimes, from lack of space, it becomes necessary to place the range boiler in the basement where it will be below the level of the water front. Such an arrangement is not advisable if it can possibly be avoided. If it must be done, however, see to it that the flow pipe from the water front to the range boiler is not run downward directly into the top of the range boiler.

22. This hot water flow pipe should be run upward for a greater distance than the measure of the distance that the boiler is dropped; a loop being then made and the pipe dropped from the loop to the top of the range boiler. The range boiler will then heat, although it can not always be expected to heat as well as though the boiler were set after the usual manner.

23. At the top of this aforesaid loop air is liable to be pocketed. This can be removed quite easily if a pipe be run

connecting some of the hot water faucets on the floor above to the same. Otherwise an air valve will do the trick, it has been found.

24. Before installing any of the piping it is advisable to blow through said pipes. This may seem foolish and uncalled for; but many a plumbing job has been put on the blink from stopped-up pipes simply because the plumber neglected to take this simple precaution, assuming that he knew it all and that the pipes would keep in the clear of themselves.

25. Half-inch pipe should not be used, as previously stated, unless the job is to be run with rain water). Using the ordinary water of the country as it

comes, half-inch pipe will soon be stopped up unless some kind of a distilling apparatus be placed on the job—a thing which an ordinary owner knows little about and is generally unwilling to pay for, considering it an uncalled for extra.

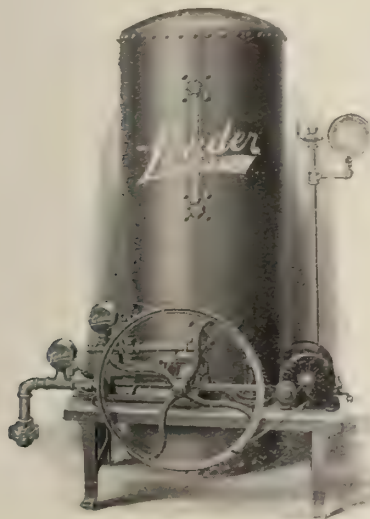
26. It is unnecessary to use white lead in making up the pipe joints. White lead, itself, does not stop up the leak. It simply acts as a lubricant, thus enabling the mechanic to turn the pipe further into the fitting. Good lard oil will act just the same and be a lot cleaner and will not dirty up the water for weeks afterward as does white lead.

(To be continued.)

New Sanitary and Heating Goods

ELECTRIC WATER SUPPLY.

The wonderful advantages now offered to the people of the rural sections throughout the country in the way of available electric current have created



a demand for electric-driven appliances without number. The above illustration shows a complete water supply equipment consisting of a tank, pump, motor and necessary fittings. There is included in the outfit a very clever device for cutting the motor in and out at desired pressures, making the rig absolutely automatic in its operation. This fills a want of long standing, many owners of homes feeling that to install a private water supply meant a basement full of machinery or much time spent in operating a hand pump.

The Leader Iron Works, of Decatur, Ill., and Oswego, N. Y., manufacturers of this equipment, state it has been a wonderfully big seller due to the ease

with which it can be installed and operated and low cost of maintenance. A catalogue of the complete Leader Line of Water Supplies will be mailed on request to either of the above offices.

NEW SMOKELESS BOILER.

Steel & Radiation, Limited, are putting a new style of boiler on the market which, they claim, is a great improvement in heating boilers. It will be known to the trade as: The Royal Smokeless Down Draft Boiler and if as the name implies "Smokeless" it will surely have a very commendable place in the boiler world. Our City Fathers all over the Dominion are at present making quite a crusade against the



smoke nuisance, so this boiler will evidently have no fears from that score and the fireman will also rest easy on the matter.

A DETRIMENTAL EFFECT.

That the present plumbers' strike may indirectly affect the health of Calgary citizens is indicated in a paragraph of the monthly report of Health Inspector Dunn to his chief, Dr. Stanley Mahood, medical health officer.

"It is to be hoped," says the report, that the plumbers' strike will not last for any length of time as there are quite a number of people installing sewer and water connections at the present time, and of course the work of the department will be put back a good deal."

Inspector Dunn's report shows that there were 23 prosecutions for violations of the health ordinance last month, and fines were imposed in most of the cases. The offences included keeping dirty premises, dumping manure, failing to provide manure bins, keeping manure about the premises, peddling uncovered fruit, and having decomposed fruit on the premises.

Stamping Out Flies.

"We are doing a lot," says the report. "to have the breeding grounds of flies disposed of such as manure dumps, and sloughs, etc., which are being treated either with formalin or chloride of lime or being filled in with ashes. No one is allowed to keep manure about his premises for any long time as all tenants of stables must remove the manure at least once a week, but I fully realize that the city itself is the worst offender as it is using Victoria park for a dump. When the incinerator at Nose creek is in operation, as much manure as possible will be burned so as to cut out the dumps to a certain extent."

The figures on collection and destruction of garbage include the following destroyed at the incinerators: 3,029 loads of garbage, 449 of trade refuse, 4 of fish, 21 of fruit, 8 horses, 26 dogs, and 1 monkey. At the Nose creek and Bonnybrook dumps, the following were deposited: 1,529 loads of manure, 49 of garbage, 57 of fruit.

APPRECIATES PAPER.

I beg to acknowledge receipt of a copy of The Sanitary Engineer, which I appreciate very much. Your issue of May 15 contains very valuable information to all, and especially to those who are interested in sanitary work.

*Yours very truly,
J. B. Hollingsworth.*

Sanitary and Heating Markets

TORONTO.

Toronto, June 14, 13.—There is general satisfaction felt throughout the City at the business being done. Prospects are good, while orders are a little slow on account of the backward state of the buildings, material for roughing in

is in fair demand and jobbers are making up their stocks for ready shipments in the near future. Several houses report they are having better demands for higher priced goods than has been experienced for some time. The building trade is rushed to the limit on account

of the steady influx of population, making the housing problem a great feature in the city.

The situation in the West is a little dull on account of labor troubles but these, it is hoped, will be settled in an amicable manner in the course of time.

MARKET QUOTATIONS.

IRON PIPE.

Standard Butt-weld Pipe.

Size.	Black.	Galvd.
1 1/4 in.	2 28	3 18
1 3/8 in.	2 28	3 18
1 1/2 in.	2 72	3 57
1 3/4 in.	3 28	4 43
1 in.	4 85	6 55
1 1/4 in.	6 56	8 86
1 1/2 in.	7 84	10 59
2 in.	10 55	14 25
2 1/2 in.	16 67	22 52
3 in.	21 80	29 45
3 1/2 in.	26 22	35 42
4 in.	31 07	41 97

Standard Lap-weld Pipes.

Size.	Black.	Galvd.
2 in.	11 66	15 36
2 1/2 in.	17 26	23 11
3 in.	22 57	30 22
3 1/2 in.	27 14	36 34
4 in.	32 16	43 06
4 1/2 in.	36 20	48 90
5 in.	42 18	56 98
6 in.	54 72	73 92
7 in.	80 92	109 50
8 in.	97 92	132 50
9 in.	117 30	162 20
10 in.	140 10	189 50
12 in.	172 40	238 30

IRON PIPE FITTINGS.

Canadian malleable, 40 per cent.; cast iron, 65; standard bushings, 70; headers, 60; flanged unions, 65; malleable bushings, 65; nipples, 75; malleable lipped unions, 65.

SOIL PIPE AND FITTINGS.

Medium and extra heavy pipe up to 6 inch. 60 p.c., 7 and 8 in. pipe, 45 p.c. Medium and extra heavy fittings, 70 p.c. Light pipe, 60; fittings, 60 and 5 p.c.

RANGE BOILERS.

30-gallon, Standard, \$5.00; extra heavy, \$6.50.

KITCHEN SINKS.

Cast iron, 16x24, \$1; 18x30, \$1.15; 18x36, \$1.50.
Flat rim enameled sinks, 16x24, \$2.45; 18x30, \$3.00; 18x36, \$3.90.

HEATING APPARATUS.

Hot Water Boilers—45 and 15 p.c.
Hot Water Radiators—42 and 15 p.c.
Steam Radiators—44 and 15 p.c.
Wall Radiators—37 and 15 p.c.

SHEET ZINC.

5-cwt. casks 8 25 8 00
Part casks 8 50 8 50

BOILER PLATES AND TUBES.

Montreal. Toronto.

Plates, 1/4 to 1/2 inch, per		
100 lbs.	2 40	2 50
Heads, per 100 lbs.	2 65	2 75
Tank plates, 3-16 inch ..	2 70	2 80
B'l'r t'b's, 100 ft. 1 1/2 in.	10 45	9 75
" " 2 " "	9 60	8 70
" " 2 1/2 " "	12 25	11 00
" " 3 " "	13 30	12 70
" " 3 1/2 " "	15 55	15 80
" " 4 " "	19 80	19 00

BRASS.

Spring sheets, up to 20 gauge	0 27
Rods, base 1/2 to 1 inch, round ..	0 23
Tubing, seamless base, per lb.	0 26
Tubing, iron pipe size, 1 inch base	0 26
Copper tubing, 4 cents extra.	

BRASS GOODS, VALVES, ETC.

Ground work, 55 per cent.
Standard Compression work, 60 p.c.
High grade compression work, 60 p.c.
Cushion work, 55 per cent.
Fuller work, 65, 5 p.c.; No. 0, 70, 10 p.c., and 1 and 2 basin cocks, 65, 5 p.c.
Flatway stop and stop and waste cocks, 60, 10 p.c.; roundway, 60 and 5 p.c.
J.M.T. Globe, Angle and Cheek Valves, 50 p.c.; Standard, 60 p.c.
J.M.T. Radiator Valves, 55 p.c.; Standard, 60; patent pick-opening valves, 70 and 60 p.c.

Jenkins' Valves—Quotations on application to Jenkins' Bros., Montreal.

COPPER.

Montreal. Toronto.

Per 100 lbs.	
Casting ingot	17 75 16 25
Cut lengths, round bars, 1/2 to 2 in.	27 00
Plain sheets, 14 oz., 14 x 48 inches, 14 x 60 inches	29 00
Copper sheet, tinned, 14 x 60, 14 oz.	30 00
Copper sheet, planished, 14 x 60, base	37 00
Brazier', insheets, 6 x 4	29 00

COPPER AND BRASS WIRE.

Brass, 45 & 2 1/2 p.c.; copper, 45 p.c.

SOLDER.

Montreal. Toronto.

Bar, half-and-half, guaranteed	0 30 1/2 0 28 3/4
Wiping	0 28 1/2 0 28

GALVANIZED SHEETS

(CORRUGATED)

22 gauge, per square	6 75
24 gauge, per square	5 50
26 gauge, per square	4 25
28 gauge, per square	4 00

GALVANIZED SHEETS.

B.W. gauge.	Queen's Head.	Fleur-de-Lis.	Gorbals Best Best
16-20	3 85	3 60	3 85
22-24	4 00	3 75	4 00
26	4 25	4 00	4 25
28	4 50	4 25	4 50
Colborne Crown—18-20 gauge, \$3.90; 22-24 gauge, \$3.95; 26 gauge, \$4.20; 28 gauge, \$4.45.			

Montreal. Toronto.

Apollo brand—

24 gauge, American	3 75	3 70
26 gauge, American	3 95	3 90
28 gauge (26 English) ..	4 30	4 20
10 3/4 oz., equal to 28 English	4 50	4 40

CONDUCTOR PIPE.

2 inch, in 10 foot lengths	3 45
3 " " " "	4 20
4 " " " "	5 53
5 " " " "	7 60
6 " " " "	9 26

OAKUM.

Plumbers—per 100 lbs. 3 25

LEAD.

Montreal. Toronto.

Domestic (Trail) pig, 110 lbs. 5 25 5 20
Imported pig, per 100 lbs. 5 25 5 00
Bar pig, per 100 lbs. 5 75 5 50
Sheets, 2 1/2 lb. sq. ft. 7 50 7 50
Sheets, 3 lb. sq. ft. 6 75 6 75
Sheets, 3 1/2 lb. sq. ft. 6 62 1/2 6 60
Sheets, 4 to 6 lb. sq. ft. 6 50 6 50
Cut sheets, 1/2 c per lb. extra.
Cut sheets to size, 3/4 c per lb. extra.

LEAD PIPE.

Lead pipe, 7 1/2 c, 10 per cent. off.
Lead waste pipe, 9c; 10 per cent. off.
Traps and bends, 40 per cent.

CEMENT AND FIREBRICK.

Canadian Portland, bags, per bbl. 1 55 1 70
White Bros. English. 2 00 2 05
"Lafarge" cement in wood ... 3 40
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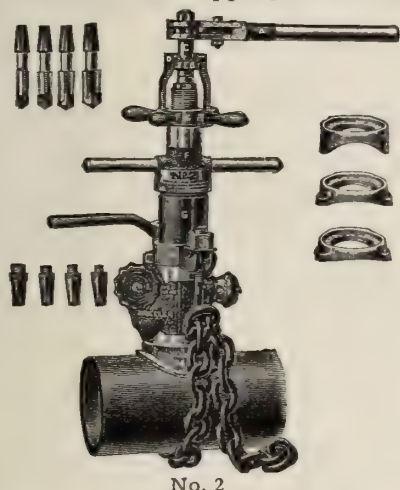
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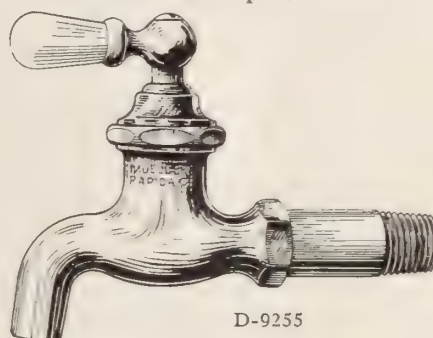
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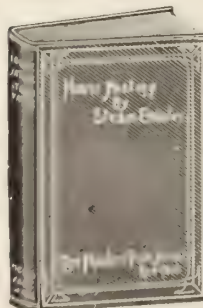
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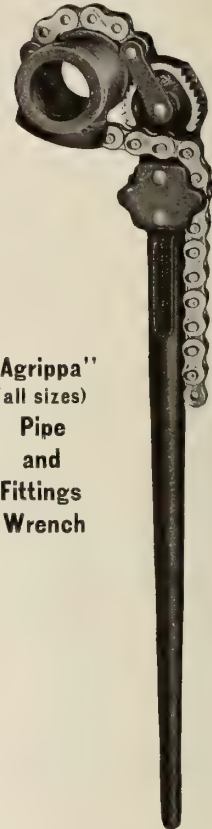
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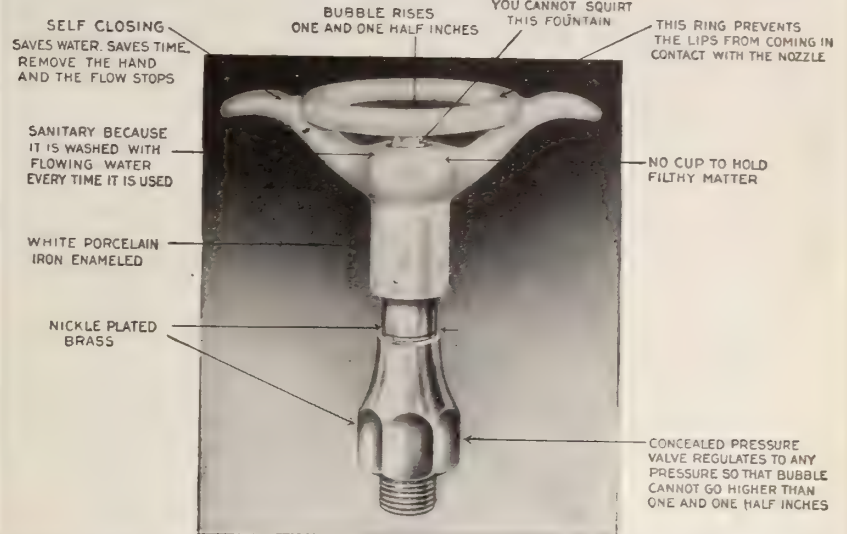
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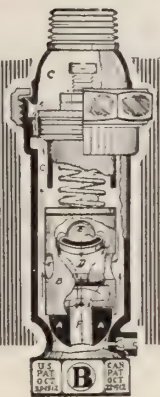
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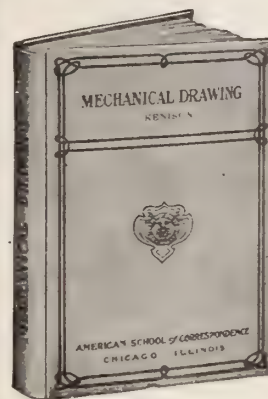
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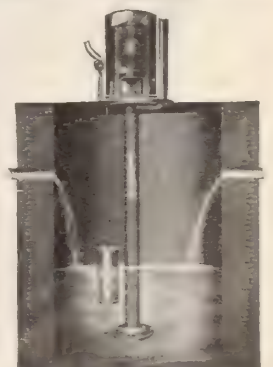


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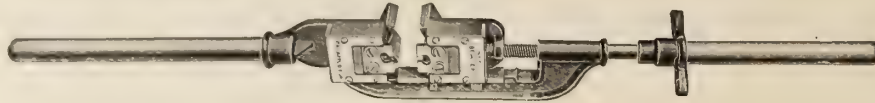
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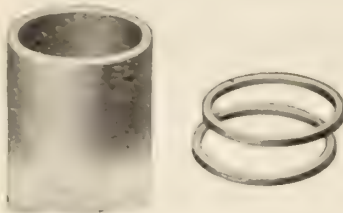
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These Valves are from a heavier pattern and of better metal than ordinary Standard Gate Valves. The gate is a double-faced wedge, with side grooves sliding on guides in the body. Wedge can be reversed and yet fit accurately. Pressure may be applied on both sides of wedge. Valves may be packed under pressure, when wide open.

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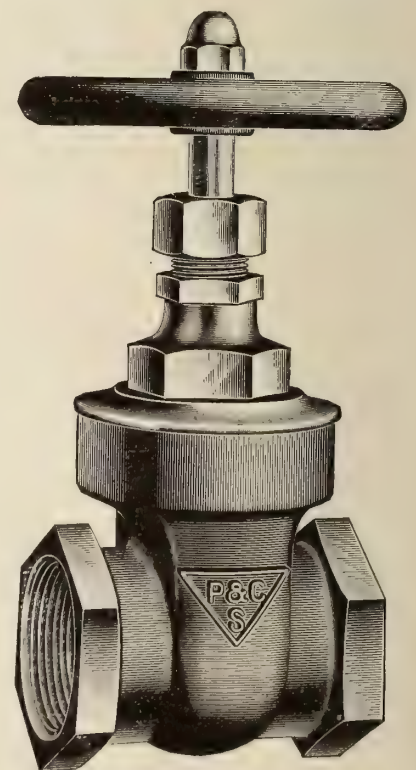
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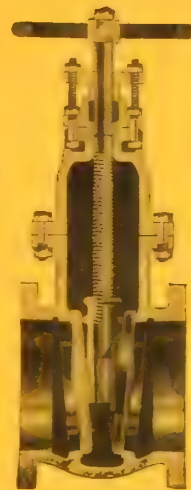
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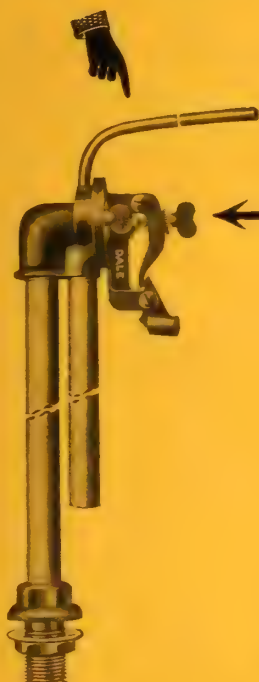
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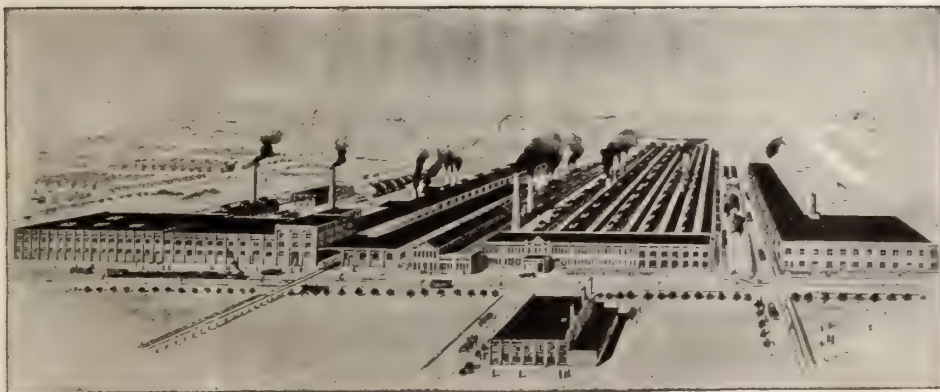
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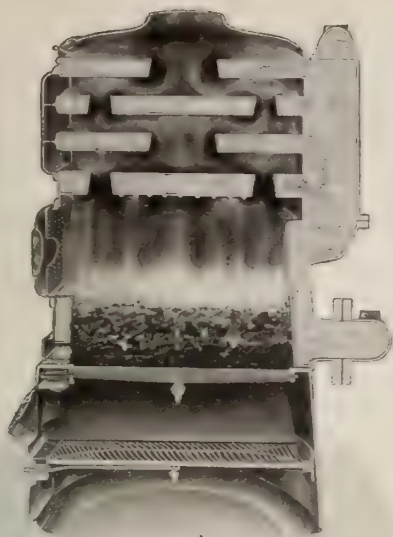
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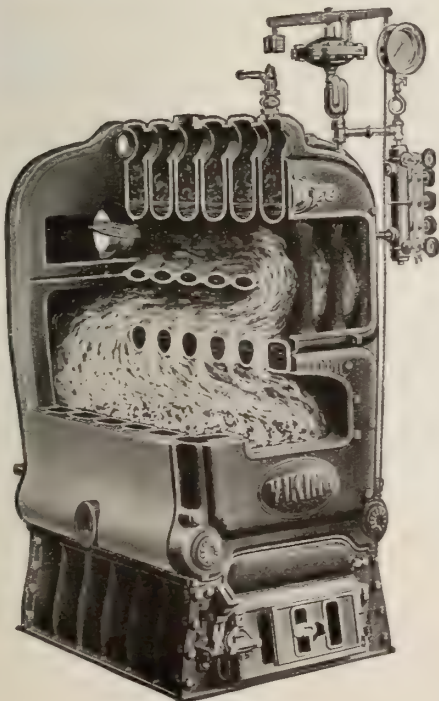


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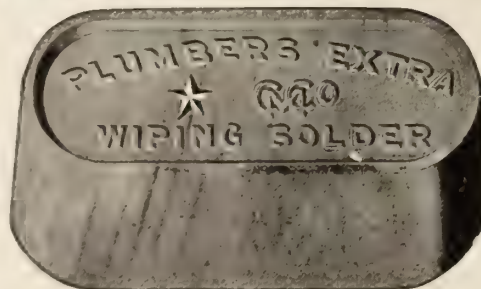


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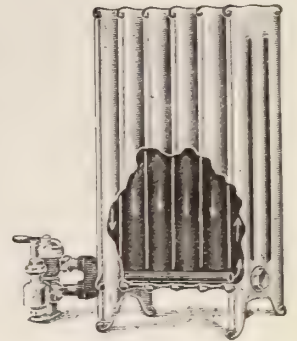


Sectional View
Showing Water
Ways.

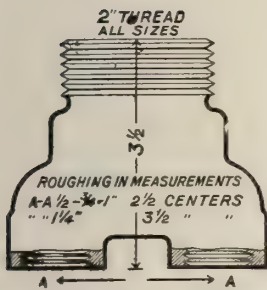
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connect flow and return
to radiator.



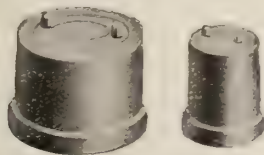
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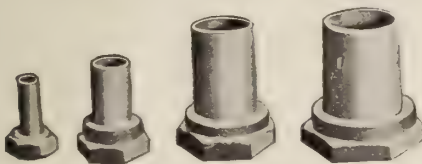
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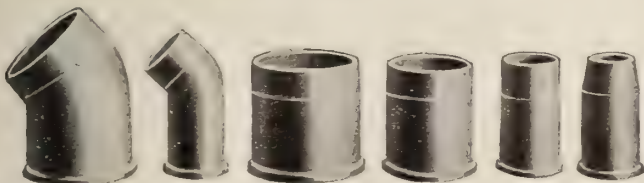
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is prevented by connecting
the unused risers.



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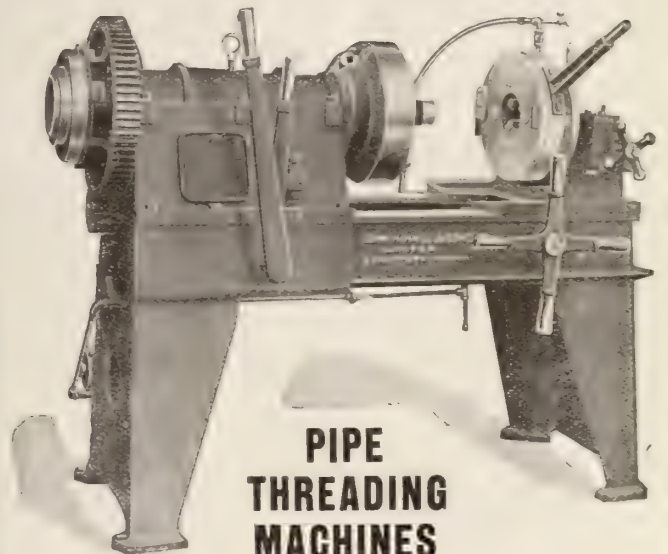
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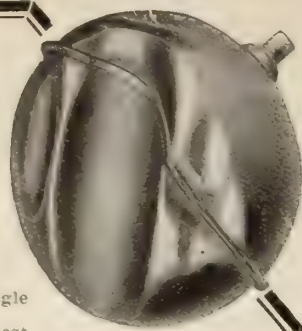
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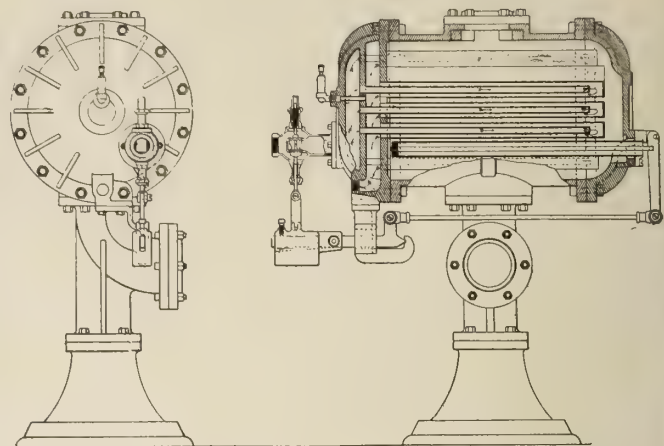
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Continuation of Report Montreal Convention

Reports from Special Committees—J. T. Blyth Invites to Ottawa Second Week of June 1914—Received with Loud Applause—New Officers Appointed—General Discussion With Supply Men and Definite Conclusions Arrived At—Next Convention Promises to be a Banner One in the History of the Sanitary Engineers.

Mr. Marr: "I would mention for the information of the members that the idea is more to secure the membership of the manufacturers than the supply house men. It is to keep them along with the engineers, and in this way we will get the supplies we are in need of. This, I think, was the idea. They could help materially by the manufacture of supplies that would be essential to the new laws."

Mr. Dorman: "The manufacturers are not supply men. Anyone can start into a supply house business, but a manufacturer is a different person; they are looking forward always to the manufacture of sanitary goods. I cannot see where supply men would have any claim to the association."

Mr. Marr: "The supply men sometimes carry lines that you cannot get even from the manufacturer. We use goods manufactured in other countries than Canada that we use in our construction work."

Mr. Shea, Fredericton: "It was the intention of that resolution that the Western Association ask that supply men become associate members, or that the Western men have become members of this Western Association. The idea is that they are simply to meet these men for social gatherings. I do not think that we should interfere with anything they have in this line."

Mr. John Watson: "I was just going to ask the same question. Was it the idea of having these men members of this association? If it is not the intention, I do not see that this association can take any action."

Mr. Gardner: "These men have an association of their own, and the way this reads it would look as if the sanitary engineers are not going to have any society of their own. If these men have an association of their own and another with us they are going to be top notchers."

Mr. Dorman here read the section of President Young's report in which the recommendation was contained. "Maybe you do not get the drift of the recommendation, which advocates the formation of a society of this kind in the East. We merely touched on it in following out his report."

Mr. Gardner: "Is it President Young's idea?"

Mr. Dorman: "Yes. It would be a separate association away from the Na-

tional, but he requests this association to give them our assistance."

Mr. John Watson: "I know that thing has been done in the West."

Mr. Frost: "I might add a word of explanation. This convention was called by the plumbing inspectors, and when the Edmonton society sent their delegates there they sent them there on an invitation from the plumbing inspectors, and the journeymen and master plumbers had had representation there and plumbers from all cities in Western Canada, and also the supply houses. This is a society entirely separate from our society, and I think the idea is that this is not to be a purely Western society, but that it is expected to expand until it covers the whole Dominion."

"The reason that the supply houses and manufacturers were invited is because in the West we are situated very differently from you in the East. We are a long way from the base of supply, and we must have as much standard stock as possible. It seems to me that all this association can do is to approve of it or disapprove of it. It is simply a recommendation."

Mr. Dorman, Moncton: "If I might be permitted again to make another remark, I think that all that is necessary for this body to do is to express their sympathy with this work and to endeavor to assist as far as is possible in the formation of this association of plumbing inspectors over the Dominion. It is not a new body, as all who have kept in touch with the advance being done along the lines of sanitary engineers know. We know that there are such bodies as the Plumbing Inspectors' Association. I think all that is necessary is for this body to express their opinion as being strongly in favor of the formation of such a body, and it will advance the business along more sanitary lines, and help the master plumbers in general."

Mr. Godwin, Halifax: "I am strongly against having anything whatever to do with the plumbing inspectors or the supply houses. If we are going to run this thing, then let us. We do not want to bother with men who have spent but a couple of weeks at the trade."

Mr. John Watson: "This new society in the West is a distinct loss to us. The reason Winnipeg is not with us to-day is the result of that meeting of sanitary

engineers and plumbing inspectors. They have gone to work and formed a body of their own in Winnipeg. These men have got their own organization now. They were ready for organization, and these are the means they have taken. I would move that we take no action in this clause of the president's report."

Mr. Charette, of Montreal, seconded the motion.

Mr. Marr: "In speaking on this matter, one has nothing whatever to do with the other. It is neither part or parcel of this association. The sanitary engineers and plumbing inspectors have really formed themselves into a body. It is really a plumbers' association, and the idea is to get this Canadian society to work in harmony with that body in the way of providing plumbing by-laws. It is the idea to draw up a set of plumbing by-laws that will be practicable for every city and town in the West, and you can get the best returns by taking the plumbing inspectors into consideration."

Mr. Crawford, St. John: "I think we are capable of drawing up our own by-laws. In St. John we drew up our own by-laws, and we did not have to consult the inspectors. What right have outsiders to come in and direct this society?"

Mr. Marr: "The first thing you would require to do is to see that good men are appointed as inspectors; men who know something about the work."

Mr. Crawford: "We have now got a representative on the local Board of Health who is a member of one of our locals. These men on the local boards with their representation in the provincials are capable of making these laws."

Mr. Marr: "A recommendation has been passed and is now in the hands of the legislative committee to try and get such an ordinance passed in our province."

Mr. Shea, Fredericton: "I think that what has been said is quite sufficient, and that the engineers should govern themselves. Unless they get the engineers to assist them, then the plumbing inspectors cannot have a body of their own. It is not us but the Government of the country that is making the laws. We have the strength. The plumbing inspectors have not got the strength. We must do everything we can to keep our members from joining them."

Mr. Marr: "This is misleading. Plumbing Inspector Mr. Fletcher got this Western meeting together. He drew up by-laws; he took the Canadian Society into his confidence and asked for a meeting to assist him in drawing up a plumbing ordinance for the city of Calgary. He asked our help."

Mr. Shea, Fredericton: "The Government prepared a code of laws in New Brunswick, and when the sanitary engineers learned of this we appointed a committee from our different locals and we called a meeting of a committee from the different locals to discuss the question."

Mr. Gardner: "Do you think this society was the means of drawing Winnipeg away from us?"

Mr. Marr: "Not in the slightest degree."

Mr. Gardner: "It seems to me that if this body got strong enough it would be well if we worked in together. They would have a big effect in finding out poor workmen and contractors. We do not want them to work in our society, but to have us work together. I know here in Montreal a plumbing inspector is appointed by pull, not by what he knows about the trade."

Mr. Marr: "A man before he can become a plumbing inspector has got to be a plumber or a sanitary engineer."

John Watson, Montreal: "I would like to rise to a point of order. The By-laws state that no member shall speak more than once on the same question until all the members who wish to speak have had an opportunity to do so."

Mr. Dorman, "Clause 4. Re quality of material. Poor and defective material, where manufacturers or supply houses are at fault now replace the article only. No redress for lost time and replacing. Strong action must be taken in this to protect the man who installs."

Mr. Shea, Fredericton: "I think the members agree that it is the desire of every man in business to get what is fair. If he gets a piece of material that is defective he does not desire to be the loser, and I think and will make a motion to the effect that this be brought up with the supply men this afternoon."

Seconded by Mr. Gardner.

Mr. Dorman, Section 5. We would recommend that Mr. Gardner's request re Provincial vice-president for Quebec be adopted."

Mr. Charette, Montreal: "We appreciate very much the work of Mr. Gardner and believe that he is the right man in the right place."

Mr. Gardner: "I might say that in Montreal I can get along all right, but in the smaller towns I have some trouble making myself understood."

Mr. Conroy: "I think Mr. Gardner should remain where he is. I know that when a Frenchman wants to understand an Englishman, he generally succeeds."

John Watson, Montreal: "I would move that resolution No. 5 be adopted and turned over to the nomination committee."

Seconded by Mr. Conroy.

Mr. Dorman, Section 6: "Mr. Legrow chairman of the Legislature Committee. We would recommend that the request for funds to provide a charter be taken up at the Convention and sufficient money be raised to meet expense of same."

"This is something that there are probably a good many here who are in the dark as to what it really means and we may have made this recommendation a little hasty so I want you to look into the question carefully and that the whole question be discussed here."

Mr. Dorman: "I might explain that the Canadian society was authorised to take steps towards getting charter for this body. Finding themselves hampered for funds and being so much taken up with provincial affairs we would recommend that Mr. Legrow's recommendation be adhered to and that his request for funds to secure charter be provided by this association."

Moved by Mr. John Watson, seconded by Mr. Gardner that clause 6 be adopted and funds be provided for this purpose.

Mr. Dorman, Section 7: Report of vice-president Priestly of Alberta. We note remarks in his report of continual neglect by the members and would request this convention to impress this matter on their different locals generally.

"There is apparently a general tendency all over the Dominion to step back and allow a few men to do the work and we believe that there should be some way to enthuse more."

Mr. Shea: "No doubt we all agree with Mr. Priestly. I want to say that in New Brunswick we have the interests of the association so much at heart, that we impose a fine of twenty-five cents if a member misses a meeting and if he misses two meetings he is fined one dollar. He is not allowed either to get any of the benefits of the society until these fines are paid. There are seven members in our local and we always have at least six at a meeting. We have never had occasion to fine a member as yet."

Mr. Crawford, St. John: "I would move that the vice-president of each district urge upon his association the necessity of better organisation."

Seconded by Mr. Gardner of Montreal.

Mr. Frost: "It is a deplorable fact that the interest is not taken in our

organisation that there should be. The interest is not taken even in the annual convention. We have members here who have come a long way to attend this convention and I have not yet seen their faces in the convention. We will have to prove to the general public that we are working for their benefit as well as our own. Section 8. We also note with regret the continual reports throughout the Dominion regarding supply houses and manufacturers not giving justice to the trade. This deserves a great deal of attention."

Mr. Frost: "This is one of the big troubles in Ontario, that they have not protection from the supply houses and if we cannot do anything here we will have but a small chance of accomplishing anything individually."

Mr. Dorman, Moncton: "If I might be permitted as chairman of this committee to say a few words on this matter. In looking over the reports from the provinces and in conversation with the different members of this association from the different provinces we find that this prevails pretty generally all over the Dominion.

This is something that really ought not to be if we are what we claim to be; if we are organized to try and better our conditions, there is one way in which we should try and do it, and that is through the protection of the supply houses and manufacturers. If we are content to meet year after year without getting at the root of these things and having them remedied then our association is worth nothing to us and I think that we are wasting time, and as some of the members remarked we would be accomplishing far more in organizing for our own protection nearer home, than in working in a Dominion body that is giving us no protection. We stand to-day without protection after eighteen years. It has been a hard road and we should have more to show than we have. We are here this morning with a representation of about twenty members, knowing that there is business to be done. We are business men and we are out to do business and we should do it in a business way, and we feel that this association is losing valuable time year after year in not getting together and forming some plan by which we can protect each other in our trade.

It is simply a matter of doing business and I think we should do it now that we are here."

Mr. Gardner: "I might say as far as the Province of Quebec is concerned we have accomplished a lot. When we discovered a firm making plans for a small plumber we stopped them and they now put on an extra discount for

the men in the trade, and as far as I can hear, in the majority of cases I think this is followed pretty closely. The supply houses here stand by us."

Mr. Crawford: "I might say that this is the main obstacle in New Brunswick. One firm gave us to understand that they would not recognize us in any shape or form. Another firm told us that they would and when we got down to real business they informed us that it was against the law and that they would make themselves liable if they went into any combine with us.

If we cannot get a guarantee that we will get protection we do not think that we will fall in line another year. We were instructed to fall out if we could not get protection from this society. If not we break away next year. This particular firm that gave us to understand that they would not recognize us are doing the bulk of their trade in the West. Our idea was that if any trouble arose that we would notify the president of the Canadian Association, and that he would notify the vice-presidents of the provincials, and that he would in turn notify the presidents of the locals, and the members would be notified in this way."

Mr. Frost: "That is one of the burning questions of the trade to-day, and the same trouble exists all over the Dominion."

Mr. John Watson, Montreal: "I might say that this question has come up at nearly every meeting of the Canadian Society, and we figured last year that this new Dominion Directory that we are endeavoring to get out would have some bearing on this question, and we got into line and issued a list of a lot of manufacturers, and this proved of great assistance. I do not think that this association could give them that protection. I think if we get in line with that directory that it will overcome a lot of the difficulty."

Mr. Haslett, London: "I think New Brunswick asks a good deal when they ask us to guarantee them protection. Canada is a very large country, and it does not take very much money to set a man up as a curbstome plumber, and this is the thorn in our society. The best protection is in our own provincials. We can then array ourselves in line of battle to much better advantage. I think if New Brunswick were to become better organized I think that they would get more help, and then they could come here and make representation to the members and get better satisfaction from the wholesale men.

"I have been in this game for twenty-five years, and I know what I am talking about. Personally, I think we can do a great deal more by moral persuasion

with the wholesale men than when we undertake to fight them. It is a case of money makes the mare go, and their mare can generally go a little faster than ours. We should impress this upon the wholesale men. You can shame them into a good deal. The travelers do not want to do what is not right. I think along these lines you can do more than by going at them with a club."

Mr. Marr: "As regards supply men, I wrote all the supply men and manufacturers of the Dominion asking them their opinion about this association and asking them to let me have a reply if they were favorable to our association. I received sixteen replies. This did not show a very large percentage of manufacturers and jobbers who are in line with this association."

Mr. Shea, Fredericton: "I might say that there has been a wrong impression. We did not come here with the intention of getting a guarantee. All we ask is a reasonable amount of protection. We consider ourselves in New Brunswick better organized than you are here, and have things working very well. The only trouble is, as Mr. Haslett has said, these curbstome plumbers are the thorn in our sides, these fellows can take a job at a much lower figure than us, and the manufacturer may get his money for the first job, and he may or may not get his pay for the material used in the second. Our manufacturers in St. John do a big business all over Canada, and we simply want you to say something to these people that will help us along at home. We know that it is impossible for you to guarantee us protection."

Mr. Roantree, Saskatchewan: "Our trouble at Swift Current has been not so much with these small men as with the big contractors. At the present time there is a \$200,000 hotel being erected there, and the contractor is buying the plumbing supplies in Toronto cheaper than we could buy it. This contractor is doing a lot of work, and is at present building all the Union Banks in the West, and he is not buying the material at our price. I cannot see how these men can beat us in buying. We cannot find out exactly where the stuff comes from. It is a Toronto firm's goods that have come in there, but I understand that they are not selling direct to this contractor.

"This is the one grievance that our association have—we have an idea where these goods are coming from, but we cannot prove it."

Mr. Dornan, Moncton: "I would like to say that, while we in New Brunswick are young in association matters, we pride ourselves in having accomplished more than has been done in any province in Canada to-day.

"We are not yet two years an organization, and we have got our province thoroughly organized. There are only seven plumbers in the province that are not associated with this association. We have got things in that state. There are plumbing goods lying in the city of Moncton to-day that have been there for a year and cannot be installed. We had some fitting goods from Ontario landed there and not a plumber would touch them. This is the state of affairs that should exist. When you find a man going out and buying goods from someone else let him get the man he bought goods from to do the installing. If we could have that understanding throughout the whole Dominion it would prove a great advantage, and it would be an easy matter to get correspondence passing back and forth among the different societies informing one another of the state of business and in this way I claim we can do a lot of good. There are conditions existing in the West that we should be glad to know about, and that would be a benefit to us, and the same thing applies to those in the West as regards the East. There is no question but that we should get in closer touch with one another. Here we have to-day a letter from Edmonton asking us for information regarding organization in the different provinces here. This is along the right lines. We should assist one another as a body."

Mr. Dorman moved, seconded by Mr. Roantree, that secretaries of different provincial organizations be instructed by this body to correspond with the secretaries of the different provinces, so that when anything arises which requires the attention of the different provinces that we will know who to correspond with and who to apply to, and we can state our case as it is."

Mr. Roantree: "As regard any installed material, there is a contractor I have in mind, and there was a case in Calgary two years ago where men were brought from Toronto to install the goods."

Mr. Dorman, Section 9: "We note with pleasure in secretary's report the advance being made in the Western provinces, but regret the dilatory action of officers throughout in not keeping in touch with the secretary and assisting him in his work.

"It is to be regretted that this work is not better looked after, because it leaves the secretary in a bad position, because he cannot bring in an intelligent report and leaves the association as it is to-day."

Moved by Mr. Walsh, seconded by Mr. Fullerton, that report be adopted and filed. Carried.

Section 10.—Mr. Dorman: "In reference to taxing foreign contractors, we note Builders' Exchange in convention at Calgary in 1913 have adopted a resolution passed at our last convention in connection with this matter. Would recommend that our secretary write the secretary of the Builders' Exchange to these results."

Moved by Mr. Roantree, seconded by Mr. Shea, that resolution No. 10 be adopted. Carried.

Section 11.—Mr. Dorman: "This is in reply to the vice-president of New Brunswick, Mr. Blake, and we would impress upon the Canadian Association the necessity where possible of a qualified master plumber being placed on all provincial and local boards of health."

"We have met with considerable success along these lines in New Brunswick, and we are reaching out for further results. We expect to have a further appointment made, and we believe that this is one of the stepping stones towards the carrying into effect of sanitary laws."

Mr. Marr: "I should like to know if there is any special way of approaching these bodies."

Mr. Dorman: "We approach them through our provincial association. We showed them the necessity of having sanitary engineers on the Provincial Board of Health, and that they should have a man who was thoroughly acquainted with the sanitary conditions, and that this was just as important as the medical man. A doctor could not tell whether the plumbing work was sanitary or not. We felt that by getting a representative on this body that it was going to be a great stepping stone all over the country."

Moved by Mr. Gordon, Montreal, seconded by Mr. Fullerton, Toronto, that this report be adopted. Carried.

Mr. Haslett, London: "As far as Ontario is concerned it is useless to take any action along these lines, because the Legislature now has this question in hand. I might say that as a member of the Board of Health of London I occupy the office of sanitary engineer, and on questions with which I am familiar I find the other members backing away, and I might say that the board has taken my stand on all questions that have come up, feeling that they have a practical man to look to."

"It is very important, as my friend from New Brunswick has said, to have a sanitary engineer on these boards, because he sees all the questions that come up."

Mr. Frost: "We are now back to where we started yesterday, or to the clause that was under discussion yesterday. I move these clauses one and two

should be read at the same time, as one refers to the other."

Mr. Dorman here read clauses one and two.

President's report—Section 1: "The suggestion of a formation of a Western branch, also that the National be an executive body only, recommend that the suggestion of President Young, that the National be an executive body only, be adopted. That the constitution and by-laws be amended to comply with this, and that secretary of this body be located in the central part of the Dominion. This executive body to deal with all matters of importance relating to the Dominion as a whole, and chiefly with our relations with the supply houses and manufacturers, and that this executive body consist of the presidents of the different provinces, who shall elect their own officers and nominate a member to represent all unorganized provincial units."

Section 2: "Re Western branch. That a Western branch, Maritime branch and Central branch are found expedient. Their formation shall be subject only to the Canadian executive body."

Moved by Mr. Frankland, seconded by Mr. Walsh, Montreal, that clause one be adopted.

Mr. Gardner read amendment of yesterday that this question be left to incoming officers to be decided by them and that matter be discussed in the papers and that the officers study this question carefully.

Mr. Shea: "In order to bring this thing to a head I think it would be in order to accept a motion to test the sense of this meeting to adopt this resolution or not, which I understand according to the constitution could only be done with a two-thirds majority."

Mr. Frost: "I think this would do away with a lot of unnecessary talking."

On a vote being taken eight voted for the amendment and nine against.

On a vote on the resolution 20 delegates voted, eleven voting for the resolution, but as a two-thirds vote was necessary the original resolution was also lost.

Mr. Frost moved that the resolution committee be discharged.

Mr. Walsh: "I move the adoption of their report with thanks and they have worked so well that I think they should get a special word of thanks."

Mr. Gardner seconded the motion discharging the resolution committee with a hearty vote of thanks. Carried.

Mr. Frost: "We have now come to the selection of the next place of meeting."

Mr. Roundtree: "I move that Toronto be the next place of meeting."

Mr. Frankland: "It would be no use in choosing Toronto unless the Canadian Association takes the form of an executive body as they do not wish to hold an annual convention in Toronto."

Mr. Roundtree: "I will withdraw the motion then."

Mr. Blythe, Ottawa: "I would ask that the next meeting be held in my home town, the capital of this Dominion, Ottawa." This invitation was received amid cheers and loud applause, from the members present.

Mr. Blythe, continuing, said: "I have received no instructions from my friends, but am sure they will back me up when I go home and report to my friends there, what I have done, we will begin working right away to get ready for the next convention. We have the finest Hotel in Canada, and will do all in our power to make the next convention one never to be forgotten in the history of the trade."

The question was put to a standing vote and the delegates chose Ottawa as the city for the 1914 convention, which will be held in the second week of June.

An adjournment was here made of ten minutes to await the findings of the nomination committee.

While the nomination committee were in session Mr. Frost suggested that the next order of business be taken up coming under the head of new business.

It was moved by Mr. Crawford of St. John and seconded by Mr. Griffin, Montreal, that a vote of thanks be tendered the Harbor Commissioners and the Club Canadien for their entertainment of Wednesday afternoon, and the secretary was requested to write a letter of thanks to these two bodies.

Moved by Mr. Conroy, of Montreal, seconded by Mr. Dorman, of Moncton, that this society pass a vote of \$10 to the janitor of the technical school.

Moved by Mr. Walsh, Montreal, seconded by Mr. Gardner, that all outstanding accounts be paid.

An Honorarium of \$100 was voted to the secretary as a recognition for his work of the past year.

The nomination committee here reported with their nominations, which were as follows:

Nomination Committee.

Chairman, John Watson.

Secretary, G. F. Frankland.

We recommend the following names as officers:—

President, John McKinley, Ottawa; Vice-President, John Watson, Montreal; Secretary-Treasurer, E. C. P. Holloway, Ottawa; Alberta, E. McKnight; British Columbia, J. S. Anderson, Vancouver; New Brunswick, G. S. Dorman, Moncton; Prince Edward Island, B. Shaw;

Nova Scotia, H. Godwin; Quebec, John Gordon; Ontario, F. R. Maxwell; Manitoba, A. J. Hammond; Saskatchewan, N. D. Roantree.

Chairman of Committees.

Sanitary, James Marr, Calgary. Hearing, R. J. McCauley, Montreal. Legislative, J. Blyth, Ottawa. Apprenticeship, W. C. Crawford, St. John. Essay, James E. Walsh, Montreal.

On it being stated that there were no further nominations, the nominations were declared closed and the secretary cast one ballot.

The new officers were then escorted to their chairs. Mr. John Watson, taking the chair in the absence of the President.

Mr. John Watson: "When I allowed my name to stand as Vice-President I did not realize that I was to be put to work so soon."

Moved by Mr. Walsh, seconded by Mr. Frankland that a vote of thanks be tendered the retiring officers.

Moved by Mr. Fullerton, seconded by Mr. Griffin that a vote of thanks be tendered to Messrs. Frost and Walsh for the able way in which they filled the chair in the absence of both the president and vice-president.

John Watson, Chairman: "As the only officer present I wish to tender our thanks and I am only sorry the president is not here to get his share."

Mr. Frost: "Replying to vote of vote of thanks, I am sure that anything we have done to help this convention along we would be only too willing to do again. I am only sorry that there has to be any substitution of officers and I think that this year there will be no doubt but that our friends who have chairs will be present at the next convention."

Mr. Blyth: "As we are to meet the supply house men this afternoon it occurred to us that it might be expedient and we might save some valuable time if we prepared a resolution to present to the supply house men, and this we have done."

Moved by Mr. Walsh, seconded by Mr. Frankland that resolution prepared by Mr. Blyth be read to supply men at the afternoon meeting.

Some discussion took place as to who should speak at the afternoon meeting and Mr. Roantree moved that the chairman appoint six men to talk to the supply men, and these were chosen as follows: Messrs. Dorman, Shea, Blyth, Walsh, Fullerton and Marr.

Mr. Marr moved a vote of thanks be tendered to the Sanitary Engineer a journal which was a big factor in the plumbing business and from which a great deal is learned and through which we can touch a good deal.

They are asking us to make use of

them, and that is what I would say, "make use of them," because they cover a wide area and they do a great work. In fact if it were not for the Sanitary Engineer and the Plumber and Steamfitter the people would not know there was such an organization as ours. If you support your journal you are taking the greatest measure of supporting yourselves. I have much pleasure in moving a vote of thanks.

Seconded by Mr. Frost.

Mr. Edwin Newsome, of the Sanitary Engineer. "Gentlemen: We thank you for your kind words of thanks. We all stand for the same things. From your conversation here and outside of this meeting we find that you have already a representation, the Board of Health in some provinces, and that further advancement is expected along these lines. We want the people to know that we are sanitary engineers, a fact which is now frequently overlooked. I have had the co-operation of the press on several matters and have their promise that they will take these questions up in their columns, so as to give credit where credit is due and to keep the public informed of our aims and objects. We stand for efficiency and competent workmen, by so doing we safeguard the best interest of the people. We need to educate the public more along lines of sanitation and by so doing will be given credit as being more professional and scientific and more worthy of the calling of sanitary, heating and ventilating engineers.

Mr. Frankland moved that a special estimate be made and a sum raised to cover the deficit of this convention.

Seconded by Mr. Frost.

Mr. Crawford, St. John: At last convention we were promised a refund of \$25 expended in securing charter.

Moved by Mr. Frankland, seconded by Mr. Fullerton that this amount be paid.

Mr. Frost moved, seconded by Mr. Shea that bank be given power to turn over the funds to the new secretary.

Mr. Fullerton moved, seconded by Mr. Shea that a vote of thanks be tendered to the members of the Montreal Society for the excellent way in which they have entertained us and that we heartily appreciate the efforts of the Montreal Society.

Mr. Frost in order not to move the adjournment of this convention I would move that convention be enlarged to include the supply men, seconded by Mr. Crawford.

Thursday Afternoon.

Mr. John Watson: "Members of supply houses and sanitary engineers. We have a meeting set for two o'clock between the members of the supply houses and the engineers. We always like to

have this little meeting between the two bodies and see if there are not some things that can be suggested to help both parties.

I am not a speaker, so I am not going to take up the time of this meeting trying to make a speech.

This morning a resolution was passed here on the relation between the supply houses and the plumbers and I will ask Mr. Blyth to read this resolution.

Resolution drawn up by Mr. Blyth, of Ottawa, and read before meeting with supply men.

"Be it resolved that this convention express its warm approval of the interest which the supply houses and manufacturers have shown and their efforts towards making this convention a success, with a view to furthering the harmony which should exist, this society believes that it is its duty at the present time to put in concrete form in this resolution, such matters as have been brought to the attention of this meeting through reports from the various provinces of the Dominion, so that our mutual interests may be furthered and that friction and injustice wherever possible, be removed.

(First) This society affirms its strong conviction that the supply houses and manufacturers should see to the trade and to the trade alone and where quotations are made to the public a much larger measure of protection must be given to the trade.

(Second) This society recognizes with pleasure the efforts of the Enamelware houses to keep always before each individual master plumber the current prices on their lines and in such form as to make them instantly available, and is further of the opinion that very much more material should be standardized by the manufacturers and supply houses and its current prices kept daily before the individual master plumber and heating engineer.

(Third) That the present arrangement which prevails among manufacturers and supply houses whereby in connection with guaranteed goods they guarantee them only as far as replacing defective parts, with no compensation to the man who has to make the installation, is seriously unjust and has worked to the detriment and loss of the trade, and that it is the feeling of the society that such manufacturers and supply houses as are ready to stand back of their products with a broader guarantee, thus showing their faith in the quality of their goods, deserve the instand and hearty goodwill support and backing of every member of the trade in the Dominion. From correspondence dealt with at this meeting, and from personal experience, we would remark that the feeling is very keen



1. Capt. Bourassa, Assistant Harbor Master, Montreal; 2. Geo. Ross, Brockville, and Supply men; 3. Messrs. Israel and Hainsworth, Berlin; 4. Harry Cole, James Robertson Co., Ltd.; 5. S. R. Brewer, Esq., Thos. Robertson and Co., Ltd.

and deep on this important question and that developments will occur before our next annual meeting ensuring the amelioration of this grave injustice.

Be it further resolved that a copy of this resolution be sent to the secretaries of the respective bodies representing the supply houses and manufacturers with a request that it be dealt with."

Mr. Fullerton: "I was not quite prepared to be called upon to make any special remarks. I think this resolution expresses the opinions of the members of our association and I thought possibly this question might be taken up with the members of the supply houses here present. Personally I think this has been a grievance of long standing between the master plumber

and the supply houses, which in a good many cases is due to misunderstanding between parties concerned.

There have been many efforts made to hold conferences and patch up differences but never with any great success, and my personal view of the matter is that it does not rest with mutual agreement, it is a matter which in my opinion rests entirely with the supply houses.

In Ontario this has been a burning question with us for the supply houses are very very apt there to entirely forget to protect the man in business.

If they would make up their minds to-day, that there would be no legal side to the question at all. I think that the meeting which was called this afternoon would bring about that which we

are endeavoring at all times an amicable and harmonious feeling, to exist. I think that anything that tends to cement the two bodies will be of a benefit to us, and I feel sure that when both sides of the case are out the supply men will see the justice of our cause.

There is certainly no justice in handling material without profit and we must make a profit on the material if we will keep in business, and I think that in Toronto we are about the only ones who are troubled in this respect.

I think that this feeling should not exist at all. We should be prepared at all times to deal fairly with one another and we should cut off the names of those who are keeping the trade in general in a rut.

Mr. Lockhart: "I endorse all the statements of my confrere. Only thing we can do is to work in harmony with one another and stick to trade relations. I have very little to say on the subject. I endorse the sentiments entirely."

Mr. Walsh: "I must apologize if I have kept this meeting late. I cannot talk shop with the wholesale people. I have always received the most courteous treatment from them and I feel that if I was short I could borrow money from them."

Mr. Baxter, James Robertson Co.

"We quite agree with the sentiments expressed in this resolution with a proviso with regard to selling the public at large. It is absolutely necessary that we must do so. That is the law of the land, but we do not sell to the public at the same price we sell to the master plumber. I repeat that we are in sympathy with the intent of the resolution."

Mr. Baxter, we have two discounts, one for the master plumber and one for the consumer."

Mr. Blyth: "The point prominent in my mind with regard to this resolution is the question of prices and discounts to the trade and the public. I recognize under present ways of doing business it is necessary for the manufacturer to advertise his wares and keep them before the public and they find it hard when getting replies from the public not to quote them prices on this material."

In making such a price, however, it should be made so as to give the plumber and sanitary engineer sufficient percentage to do business."

In connection with heating and plumbing goods they have made a price to the public with a fifteen per cent. rebate to the trade. This is not enough for us to do business on."

I think it is quite necessary now that we are convened here together where the delegates to this convention represent the feeling of all Canada that it should be discussed thoroughly here. I understand that one of the manufacturers of boilers and radiators has sold to a contractor in such a way as to cover himself up. The only thing for us is to bring this question up carefully and we would have a clear case against that member. If it is a clear case then it should be reported at once to the secretary of our society to be dealt with. It is only by co-operation like this that we can work together."

Mr. Smallpiece, Taylor, Forbes Company:

"There is only one thing that I can say and that is this that if the master plumbers will do their part to the manufacturers they can rest assured that we do ours, but we have got to get some assistance from the master plum-

bers before they can ask us for any more. I do not know that the percentage given to the plumbers is known to the public. I have heard men state that such and such a man must be giving away his discount to get the price down."

If you do right with the manufacturers and see that your members live up to the agreement that you make with them the manufacturers will do right with you."

Mr. Dorman, Moneton: "We are speaking on a question that is of vital importance to the plumbing trade throughout our Dominion and I think it is also a vital question with manufacturers and jobbers."

The plumber that is trying to do business in Canada to-day and trying to make a fair profit is up against a hard proposition, when he has to meet the general contractor who in some way or another can go out and buy goods and get plumbers to install that work."

To do business on a business basis you cannot work on much less than 30 per cent. when you take into consideration the cost of handling radiators and boilers, installation and the cost of replacing defective parts which is always to be reckoned on even on the best possible material to be secured. You will admit that when all this is taken into consideration the percentage is reduced to a very small amount and we know that we cannot stand it. You are dealing with men who are doing a straight business."

These are questions which we think should be brought to your attention and I think that the manufacturers should meet the sanitary engineers, so that they can pay dollar for dollar and still have a dollar for a rainy day."

Mr. Waverley. This question apparently centres around three points, the question of selling to the consumer. Of protection, and of guarantees. We sell nothing to the consumer and the prices we quote in our show rooms is twenty-five per cent. above the plumbers' price. We have always done our best to protect the master plumber and we are getting out price list with this end in view, and we are now thinking of getting out a list for the consumer and if this will be of any benefit we will be glad to do it."

Regarding the question of guarantees we cannot get high enough prices to compensate the plumber for defective enamel ware. Seventy-five per cent. of the goods that is returned to us as defective goods is either broken in transit or broken on the job. It seems hard that manufacturers cannot guarantee this material. I think that it is a pretty hard question for us, the enamel ware manufacturers to solve to-day. It has

been tried in the United States, and I understand that the firm that tried it spent thousands of dollars and finally had to discontinue."

It is something we would like to do, but I cannot see how we are going to do it, and I think if the other manufacturers were here they would tell you just what I have told you. As Mr. Rockefeller would say, "We are in a very hazardous position, we would like to do something and cannot."

Under ordinary circumstances this is a pretty hard thing to do and I do not think we can do it under present conditions."

James Marr, Calgary: "I am beginning to think that I am here for nothing but kicking. Personally I am not much of a kicker. I am here representing quite a large number of men in the business and where there is a large number of men there is always a number of kicks. Some of them are justified. We have had complaints from some of our members of goods delivered that were not O.K., that is they were sent out from the works defective, probably from want of care in the supervision of manufacture. This, of course, will happen some times in the best of regulated business, but it is a very hard thing that the poor plumber should have to stand good for the faults of the manufacturer."

Take a defective radiator, it is not found until it is installed. We very rarely figure on doing our work twice; it takes you all your time figuring on installations once. If you have got to take out a defective radiator, it takes time and material, as well. You have got to stand the cost of that when it is no fault of yours. The contractor may replace the part or piece, but you are in the hole to the extent of the replacement. Why should that be?"

He is paying you the price of the article O.K. Now I do not think that it is fair that the manufacturer should insist on the engineer being the loser, when the responsibility lies with them."

Sanitary engineers sometimes try to get something that does not belong to them in the shape of damaged goods, when they may have been responsible for the damage themselves. This, I have no sympathy with at all, but where the defect is purely the fault of the manufacturer, I do not think it is fair that the plumber should stand the expense."

I was told very distinctly to impress the manufacturers with this particular point. We are a long way from the source of supply and we do not buy two pieces when we only want one, to provide for a defective piece. We just order what we want. If you get a defective piece, and the defect shows in the middle of winter, we have little prospects of receiving the piece to replace

the detective part before the next winter.

Some hold up your account until that is fixed, then you are handicapped to that extent; or they will retain so much until the defect is made good. If you have a few jobs like that, imagine the position of an engineer. That, I think, is about all I have to say on that point.

Another point is with regard to manufacturers preparing plans and figures to others than those capable of making plans and preparing their own prices. This, I think, is something should be put a stop to. It is too bad that a man who spends his time in hard work to qualify himself for this business should have to stand aside when another man comes along with a tin head, and who has never spent five cents or his fellow, yet butts in ahead of the man who has qualified himself for this work.

I think this is one of those things that the manufacturers should take up and give their best attention to, because it concerns them in two ways: Often a man is not a very capable man; he is a weakling and very often he has two or three weak points apart from being a bad financier. These men that they are helping along are taking work cheaply. They are in competition with men who are always up to date with their payments; they handicap him because they always keep cutting the price; it hurts the man who is capable because he must reduce his price to meet this man's figures, or he is not able to pay his overhead charges and he has to keep down to rock-bottom prices.

I do not know that I have any remarks coming. You do not want to hear too many kicks. We should like you to see little bits of sidelights into our business and, as a result of which, we might get together and try to balance things a little better."

Mr. West, Steel Radiation: "I think the matter has been covered quite clearly. I see no reason why manufacturers should not give their accord to these differences. So far as I personally am concerned, I would welcome situation where prices were entirely limited to the market."

Mr. Delaney, Thomas Robertson & Co.: "So far as we are concerned, we always extend protection to the plumber. We have two prices and we have always lived up to these prices. Any time the consumer comes in, he is given our price. The consumer buys for himself, but we protect the engineer and, whenever possible, we pay him the difference between the consumer's price and the engineer's price. So far as the heating appliances go, I am not capable of speaking on that point."

Mr. Shea, Fredericton: "The ground

has been so very well covered I do not know what I can add to the remarks of the different speakers. It is very difficult to vent grievances of this kind to manufacturers who have our made our stay among them so very pleasant. Down in our section, we have not got so much to attend to. The chief trouble is with representatives who come there prepared to make estimates with individuals. Generally, there is a fellow who is running around looking for contracts who has no place of business; who will take a day's work, if the party who is doing the work can furnish the material.

A traveller came into my store very recently and he said that he was down in the interests of a firm selling heating goods. He asked me if I knew of any contract and said he was willing to help me to figure on that.

His reception from that point was not cordial, and, no doubt, the representative of his house here to-day has heard of this before. We want men to sell goods to the trade only. When this man moved to the next town, he reported Shea as having given him a call-down at Fredericton and he thanked him for having put him right. We are not up against the big contractor as in the large centres, but we are up against other things. By selling to those people who are doing business in wood-sheds, while they may pay you the first time, before you are paid the second time someone is liable to come along and take a bill of sale of their goods.

We will instruct the secretaries of our locals to keep the manufacturers informed of all men who are not receiving a legitimate price; we will give them the name, tell them of the job and give them the price. This would drive those who are not in a legitimate business back to the bench again.

I do not know of anything else I want to say on behalf of New Brunswick delegates, but I want to say on their behalf that we appreciate very much your kindness and the fine manner in which you have treated us."

John Watson, Montreal: "The time has arrived for us to take the trip around the city and to Dominion Park. We should like to hear, now, from anyone else who would like to speak."

Mr. Frost: "I would move a hearty vote of thanks to manufacturers' representatives and supply house representatives who have entertained the delegates to this convention and as far as the feeling towards manufacturers and jobbers in the West goes, we get along pretty well and I take pleasure in moving this vote of thanks."

Mr. Dorman, Moncton: "I second the motion of Mr. Frost."

Mr. Morris, Dominion Radiator Company: "Co-operation has been suggested by the sanitary engineers; we want to help you. We were called to a meeting of the Master Plumbers Association last July, when some of us were so impressed with their work that we were brought suddenly to our feet, and when it was pointed out to us that we were making blue-prints and estimates indiscriminately for these wood-shed engineers, we stopped. The Master Plumbers asked for a friendly conference; they asked that we discontinue this and I will vouch for every heating-supply house in Montreal that these plans were discontinued from that moment. I should like to go a little further and say that there is one other question that really bothers the Master Plumbers and that is the 'fly-by-night' plumber. He starts the job with \$500 and, before he is through the job, he is out \$1,000. We suffer from the loss of material and you suffer from the competition. We are as anxious to rectify this state of affairs as you are and we must get together and do so."

Mr. John Watson, Montreal: "Gentlemen of the supply houses: It gives me great pleasure to tender this vote of thanks. I have no doubt that this little talk we have had to-day will do some good. It will bring it home to the members of both parties and, as a result, these questions will have a little thought. By the time of the next convention there will be something arranged so that we can make better progress."

Moved by Mr. Franklin, seconded by Mr. Dorman, that the eighteenth convention adjourn to meet the second week of June, 1914 in Ottawa.



WILL HEAT COACHES BY VAPOR SYSTEM.

Vapor heating system is now being employed by the Canadian Pacific Railway Co. for heating their railway coaches. The arrangement consists of a series of separate heating pipes which are controlled separately by intake valves. These valves are turned on and off according to the condition of the car.

In sleeping coaches the system for parlors and toilet rooms is distinct from that of the main sleeping department so as to allow of cool sleeping apartments without discomfort to those who wish to remain out of bed.

The main feature of the whole system, it is claimed will be the possibility of regulating the heat in cars and preventing overheat in mild weather.



Montreal, Que.—Larose & Michaud, tinsmiths, roofers, etc., have registered.

Transformation in Most Dignified of Crafts

Exit Plumber and Steamfitter, Enter Sanitary and Heating Engineer—Why a Higher Education and a More Correct Impression of the Importance of the Craft is Needed Among Those Who Belong to It.

Written by Edwin Newsome.

Of all tradesmen or mechanics the most abused man is the plumber and steamfitter, and in several books on plumbing, etc., we find these facts spoken of. Now why is this? There is lots of room for discussion. Some say the plumber is not a conscientious workman. He seems to spend all the time he possibly can on a job, instead of doing it as quickly as he possibly can. His charges, too, are felt to be out of all proportion to the amount of work he does. And, like the poor, "he is always with us." Who is to blame for this impression of our plumbers and steamfitters? Let me bring a little light into this vexed subject. In the first place, his assistants are not grafted, on the whole, from the class most to be desired. The boys are generally those who have to be wage-earners at an early age, and who are not as well educated as they might be had circumstances allowed—boys who have the impression that it requires no special qualifications to become a plumbers' or steamfitters' helper; boys who have not had the most desirable home training, and who look upon the trade only as a means of earning a livelihood with the least amount of energy. These boys, too, often are sent out to help men who have had the same general impression of their trade when they were boys, and have never been given the conviction that theirs is the most dignified line of craftsmanship it is possible to follow; men who have got a grouch, which is always in perpetual motion, and all this through practically no fault of their own. What is the result? The community is being flooded with a bunch of undesirable craftsmen, instead of the very opposite.

Now what is to be done in the matter so as to remedy this state of affairs? In the first place, better educated boys are needed, and the name "Plumber" requires exterminating altogether to become instead a "Sanitary Heating or Ventilating Engineer." We have civil engineers, mechanical engineers, hydraulic engineers, stationary and locomotive engineers, and electrical engineers. Why not sanitary heating or ventilating engineers? Can any of our readers show where any of the first named occupations should be or can be as dignified a calling as our trade whatever the name may be?

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ing Machinery
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Several years ago some of the Toronto plumbers took the question up as to the advisability of changing the name of the craft and the writer was asked his opinion. The above is a cut of the stationery heading showing the ideas the above had. This heading had been in use some time before the question was asked. The editor would like to know if there are not more who designated their calling long ago as Sanitary Engineering.

It certainly has a right to its proper name. There is not a man alive to-day who can claim to be exclusively a plumber for the simple reason that the name designates. Plumber, a worker in lead. Say, where would the worker in lead be on a Durham system? The sanitary engineer is without a doubt the mechanic most to be desired. He is the first man who should be consulted by those who intend renting or buying a home to inspect the sanitary engineering of our prospective homes. He should be our best friend.

Then it's up to us that we get the necessary education, and that the public be acquainted of the fact that we need the best educated boys to learn the trade, and see to it that he is given the right impression of what the calling is, of the dignified position he will eventually hold if he studies diligently with a motive in view. Then when a few such boys become men they will be a credit to the craft. They will be a blessing also to the public, and will be looked upon as men of high calling, as men to be desired, instead of feared, as men to be respected, as having the lives and welfare of the whole human race in

their care. Therefore, let us be in future a worthy craft and known throughout the length and breadth of the land as "Sanitary Engineers."

EDWARD KNIGHT KILLED.

Plumber's Helper Meets Death at C. P. R. Shops.

Edward Knight, a plumber's helper, was killed at the C. P. R. shops yesterday by being crushed between the buffers of two cars. This is the first fatal accident to occur at the shops.

Knight had been working for the past four months at the shops. He was crossing the tracks in front of a car when he was struck by a train coming in the opposite direction. His chest and ribs were crushed between the buffers. Dr. Selbey, the company's physician, endeavored to save Knight's life, but the man was too badly injured, and died within five minutes.

Knight was 42 years of age and had a wife and six children in England. His family were to have started for Calgary next month.

The Motor Truck Economy^{*}

Showing the Amount of Ground Which Can be Covered in a Given Time as Against Horse Drawn Vehicles and Cost of Same. Scores of Sanitary and Heating Engineers Now Using Motor Trucks. Data of Which Will be Taken up in Our Future Issues.

By R. W. Hutchinson, M. E.

We have published from time to time contributions by men of acknowledged authority on hauling and delivering by motor truck, to demonstrate its possibilities for saving the bottler money and increasing his business. This month we submit the following paper, which develops several ideas of undoubted value to bottlers, desirous of being "shown" some practical comparisons between motor trucks and horse-drawn vehicles.

The first question that is asked a motor truck representative by at least nine-tenths of business firms, who are thinking of installing motor trucks, is "How much money will a motor truck save me over my horse vehicles?" The almost invariable answer is that "It depends on so and so." The qualifying conditions are enough to bewilder any business man, seriously seeking enlightenment on this important problem. The truth is, however, that no honest motor truck representative can truthfully say that a motor truck substituted for a certain number of horse teams will effect a saving in dollars and cents which can be guaranteed in round figures. Some truck manufacturers have attempted to do business on a basis of guaranteed operating expenses for their motor trucks and guaranteed maintenance expense and guaranteed economy in accomplishing the equivalent or greater amount of work over the horse equipment but it is safe to add that everyone of these companies have got the way of every enterprise which was not established on safe, sane, and sound business principles. Although no honest motor truck manufacturer will guarantee that his product will cost such and such a figure in a day, nor that the machine transportation will effect an economy in figures which can be carried to even one point decimals, the motor truck manufacturers, however, can prove to the satisfaction of any man, that when he needs motor truck equipment, and when he operates it in a manner approved by the engineering experts of their organization, that the economies will be sufficient to pay a larger dividend upon the capitalization represented by the motor trucks than perhaps any corresponding investment in equipment.

It takes but little analysis to show that when a 5-ton gasoline motor truck operating in public service delivery shows a gross profit of from \$30 to \$50 per day and a net profit of from \$20 to \$30 per day, figuring that the original investment for the truck was \$4,500, that no other mechanical equipment can show a profit of 100 per cent. per year on its cost calculating that the good motor truck is available for operation 300 business days in the year. The business man who has not actually made sufficient investigation into the earning power of a motor truck is very skeptical as to the truth of a statement that mechanical haulage is showing a profit of from 100 to 200 per cent. But public service motor express companies, who are operating and managing their enterprises on the same rigid business principles as are carried out in the cost accounting department, for instance, of the U. S. Steel corporation, are getting such results, and there are a number of truck companies that can prove that under as favorable conditions as these public service motor express companies are operating, that it is quite possible for a business concern that puts the same time and attention to their product, when it goes outside of their manufacturing and inside distributing plant, can get a similar ratio of earning in their own institutions. The only reason that the private operators of motor trucks are not earning relatively the same ratio of dividends on their investment is that they have mistaken the motor truck in itself as a cure-all for all of their motor truck problems and have not speeded up the inside details of the delivery system to keep pace with the potential possibilities of a motor truck. True, the earning of 100 to 200 per cent. on its investment is exceptional profit for a motor truck to show in private use, due to the fact that the public service motor companies can and do charge a larger price per ton or per ton mile for taking care of a merchant's delivery system. The profit, however, which a good motor truck would show when operated in private service, can and does run as high as 200 per cent. on its investment cost.

The economies which motor transportation effect in delivery are seldom

measurable on an exact dollars and cents basis, and in saying that motor truck can, for the use of a private individual or business firm, show a dividend of 100 per cent., we are fighting its earnings on the basis that the first class motor truck will enlarge the delivery area of the owner two or three times, and enable him to double or treble his business clientele of customers by making quicker and more prompt deliveries, and naturally double or treble profits. If the actual operating cost of a motor truck, which has displaced three or four teams, was taken as the measuring rule of its economy, it is sometimes the case that the expense will be larger than for the horse teams, but the earning capacity of the motor truck is so much more than that of the horse equipment through its ability to turn off twice or three times as much work, that the actual operating expense bears but an insignificant relation to its earning power. It is not the custom of the business world to place freedom from annoyance and worry incident to delays in delivery of goods on a monetary basis, and yet in truth the absence of the worry which a good motor truck insures in a business organization may have a dividend feature which by itself would make a motor truck a profitable investment even if it accomplished nothing else than to save the energy of its owner for more productive work in gaining new business equipment, as it enables the carrying out of contracts which, if not fulfilled, always jeopardize the future custom from the customer who has been disappointed.

It is interesting to note that there are two classes of motor truck operators. The first class, which is greatly in the majority, keep only such insufficient records as to prove to their satisfaction that their trucks earn a substantial profit. As to the exact amount of this profit they are little concerned and it is exceedingly difficult for the motor truck manufacturer to glean any cost records from this class of its customers, as the records are so incomplete as to give only the main facts which the owner desires to know—"The truck is earning big money." The second class of truck operators, who are exceedingly in the minority, have kept accurate

^{*}From National Bottlers Gazette.

records of their motor service costs, but they exercise the greatest care in preventing these records from leaving their offices; taking the stand that the longer they keep the information from their competitors the greater the period they can enjoy the advantage which their competitors do not possess and which enables them to make much larger dividends on equivalent capitalization than are their competitors. The writer, for example, once asked the Traffic Superintendent of one of the largest public service delivery companies in the United States for some actual records of his horse and his motor truck equipment. He was met with this rejoinder—"You can't have them. We don't propose to give away this information as it would start our competitors buying motor trucks, and the very minute they get motor trucks the superiority of the service which we can give by having motor trucks will be lost and they would be on an equal footing with us."

Perhaps no corporation in the United States is so well known for the business-like principles in the conduct of every feature of its service as the New York Telephone Company, hence the following figures are submitted. It will be noted that a 1-ton motor truck, which represented an annual operating expense, combined, of \$3,885.24, showed a net annual saving in comparison with horse vehicles of \$2,414.76, figuring the depreciation at more than 33 1-3 per cent., so severe is the character of work in which this type of truck is employed. When it is considered that 15 per cent. is the usual depreciation charge made against a motor truck, it will be obvious that the economy which this truck showed under such a burden of fixed charges is remarkable.

In Statement B, it will be observed the net annual saving for a 3-ton motor truck over horse trucks equivalent in work performed was \$1,429.01. This figure represents a dividend of 40 per cent. on an investment of \$3,750. Certainly no other part of a business equipment costing this amount of money can show such enormous earning capacity.

STATEMENT "A."

Comparison of motor vehicles with horse-drawn vehicles.

Annual operating expense 3-ton motor truck based on performance of 10 trucks, average 10,900 miles.	
Chauffeur's salary (full time, including overtime)	\$1,146.50
Garage and washing	240.00
Gasoline (.0365 per mile)....	397.85
Lubricants (.0171 per mile)..	186.39
Tires (.055 per mile)	599.50
Supplies (miscellaneous)	54.50
Repairs	240.00

Depreciation, interest and taxes	1,020.50
--	----------

Total\$3,885.24

Approximated gross annual saving on horse-drawn vehicles by 3-ton motor truck based on 7 months' usage.

Truck hire (August to February)	\$2,904.20
Car fare (August to February)	361.69
Freight (August to February)	118.00

Total 7 months	\$3,383.89
Approximated annual saving.	5,800.00
Approximated annual saving on placing cable	500.00

Total	\$6,300.00
Approximated gross annual saving by 3-ton motor truck	6,300.00
Annual operating expense of 3-ton motor truck	3,885.24

Net annual saving per truck 2,414.76

STATEMENT "B."

Comparison of motor vehicles with horse-drawn vehicles.

Annual operating expense 3-ton motor truck based on performance of 7 trucks, average 5,310 miles.	
Chauffeur's salary (part time)	\$360.00
Garage and washing	240.00
Gasoline (.0635 per mile)	331.87
Lubricants (.0325 per mile)...	172.57
Tires (.055 per mile)	202.05
Supplies (miscellaneous)	54.50
Repairs	120.00
Depreciation, interest and taxes	750.00

Total	\$2,320.99
Approximated gross annual savings on horse-drawn vehicles replaced by 3-ton motor truck.	

Teams for hauling men, tools, etc.	\$1,450.00
Placing cable	350.00
Extra truck for hauling poles	150.00
Extra truck for hauling cable	300.00
Traveling time of men	1,200.00
Labor, setting poles	300.00

Total for year	\$3,750.00
Approximated gross annual saving by 3-ton motor truck	3,750.00
Annual operating expense of 3-ton motor truck	2,320.99

Net annual saving per truck	\$1,429.01
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The most interesting example of the money saving feature of the motor truck is found in the experience of the American Car and Foundry Company, Chicago. This large corporation in a year's operation of a 6½-ton motor truck, on an exact cost accounting basis, shows that their truck transported

141-10 tons per day a distance of 33 miles at an average cost of 6.45c per day or a per ton cost of 45.8c. Adding to this per ton cost interest on the investment of 6 per cent., and all necessary motor vehicle insurance, and an annual overhauling fund of \$450, which fixed charges increase the per ton cost by 32.2c, the total cost per ton transported was 78c. With rented horse equipment their former cost was \$2.00 to \$2.50 per ton. In other words, the motor truck is saving the American Car and Foundry Co. about \$400 per month, which represents a return on the investment of 98 per cent., or is sufficient to pay for the truck in one year's service.



NEW BRUNSWICK SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS' CONVENTION.

The New Brunswick Society of Domestic, Sanitary and Heating Engineers will hold their annual convention in the city of Fredericton, on July 8th, 1913. Several of the members were present at the National Convention and proved themselves to be thorough earnest workers and put forth some very interesting instruction arguments which cannot help but bear fruit in due season. The names of those from New Brunswick were: Messrs. G. S. Dorman, Moncton; Wm. Watson, Moncton; D. J. Shea, Fredericton; W. J. Crawford, St. John; and J. E. Godwin, Halifax. All of whom had the work of their association at heart. The "Sanitary Engineer" wishes they may have a successful convention next week and will give a full report of the proceedings in July 15th issue.



TRADE NOTES.

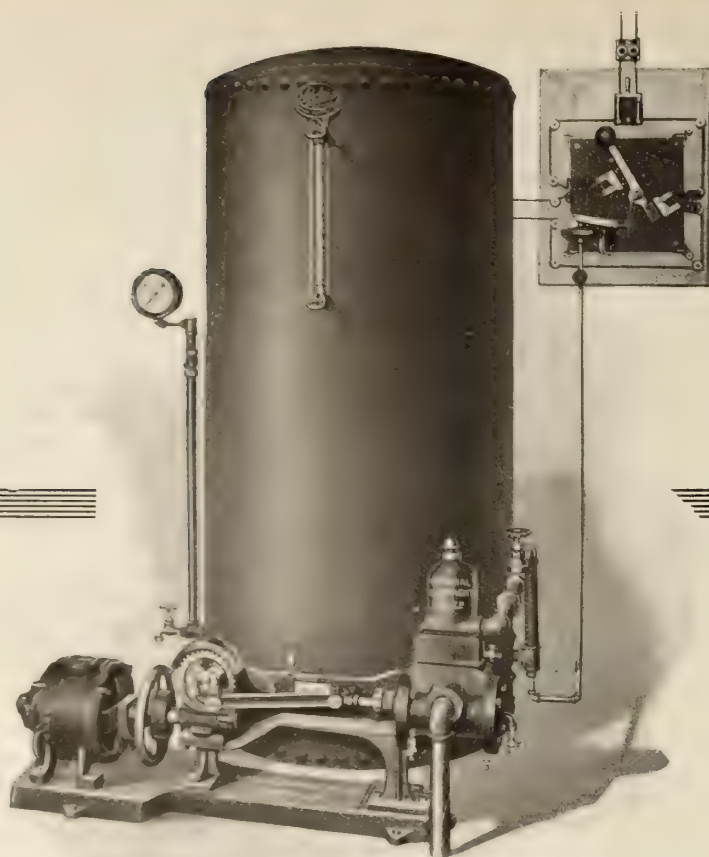
Big Order Placed.

The City of Regina has placed an order with the Canada Iron Corporation of Fort William, the order amounts to 4,000 tons cast iron pipe for the water-works. Shipments are being made daily and the Canada Iron Corporation plant is running full blast with a staff of about 425 on the pay-roll.

Business Changes.

Percy Armstrong has retired from the firm of Thompson & Homer, Saskatoon to take up business with George Lynch as sanitary and heating engineer in Medicine Hat.

Stratford, Ont.—J. R. Myers, who for a number of years has been conducting a hardware and plumbing business here, passed away recently.



Peerless (400 Series)

Direct Connected, Worm Driven Silent
Electric House Pump.

Capacity 500 gallons per hour at 50 pounds pressure, with peerless special combination air intake and automatic motor controlling switch.



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leakage due to its use.
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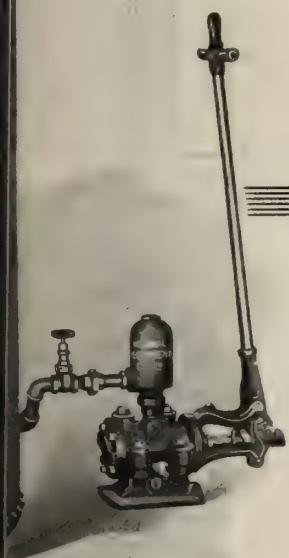
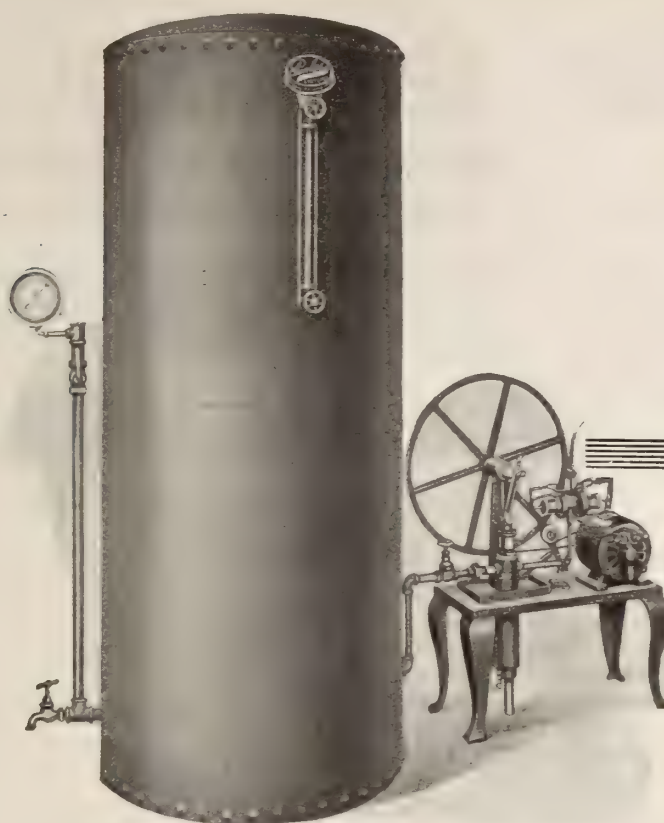


Figure 112B
Pump and Air

and the troubles from
fit with 3 sizes of tank



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Pump Capacity 125 Gallons Per Hour
Against 40 Pounds Pressure.

Absolutely silent and automatic in operation. A one-eighth horse power motor connected to a lamp socket does the work.

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thirty-five times so that we can meet the rapidly increas-
ducts has won a reputation for us of which we are proud and
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The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorriman, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, JULY 1, 1913

PROBLEMS FACED AT CONVENTION.

The chief features taken up at the convention were the per capita tax, the question as to whether the National Association should eventually evolve into a purely executive body or not, and the relationship between jobbers, supply men, manufacturers and the trade, or shall we say the sanitary engineers who were employers of men who installed the goods. The discussion re the National Association becoming an executive body was very interesting to say the least, and almost all agreed such should be the course to take. It was shown that the necessity of a paid secretary would be overcome by an executive body being formed. Of course if this step were to be taken, it would mean that every province would be thoroughly organized, that each provincial association should have its own officers including a secretary-treasurer, who would inform the secretary-treasurer of all that took place in his district. It would then mean that, whereas the present national association had a lot of clerical work to do, at a convention, a larger number of delegates was necessary, which was the cause of a larger expenditure of money. Then again each provincial delegate or say two, could have the reports in good form and ready at each convention and business could be transacted in a far more satisfactory way at a less expense. There is no doubt but that the National Association have done well. They have had a hard road to hoe, and each province is now having a hard struggle to get things into shape before any great benefit can be expected. However, it was decided that this year 1913 should be one to find out which would be the best method of management to adopt and it is to be hoped that those delegates present will see to it that these matters are discussed at great length in their respective local meetings throughout the present year and up to the time of the next convention.

* * *

The 1914 convention will take place during the second week of June, 1914, in Ottawa, the capital of our fair Dominion, and we know the Ottawa members will do all in their power to make it a successful convention, but whatever is done a full report should be ready so that business can be gone into thoroughly, without interfering with the pleasure end of the convention.

* * *

The per capita tax of course almost hinged on the way the different associations were to be managed, for instance, by uniting the different branches of all the prov-

inces into provincial bodies with no overlapping of territory. A saving could be made then by each member of each branch doing his little bit to help along his provincial association instead of counting the cash cost. Each secretary would have to put out less of his own individual efforts and at the same time accomplish a greater vital result. He would be able to keep the National body acquainted with the trend of the trade, etc. This would lower the per capita tax and increase the results. While there needs to be a tax it should be the smallest end of the argument. What is really wanted is more personal effort on the part of each member and more feeling that each one has a part to play, and for each to see that he does something in a personal way. Money will not buy or pay for the inspiration or aspirations of an earnest effort. So by personal work this per capita tax will vanish into a vague shadow. It would also settle the question regarding the National Association eventually becoming an executive body only.

* * *

Then came the question of grievances with supplymen and jobbers. This was very well discussed and we may be sure they will see to it that the trade is protected in every way possible, and while there may have been quite a few matters of cause for grievance, we must not forget what their troubles are. In the first place the buyer is very apt to choose and almost demand the lowest priced piece of goods and it is chiefly in this class of goods we find the most room for complaints and defects. The sanitary engineer generally has not had the necessary education to be able to properly judge the value of a piece of goods hence if a defective fitting is installed it is not always the manufacturer or jobber to blame, and in a passing thought where would the sanitary engineering profession be regarding its progressive stage had it not been for the venture and enterprise of these manufacturers? They have revolutionized the whole structure of sanitary engineering. It was not the primary demand for better goods and different improvements which was the reason. Then as regards supplying goods to consumers, well, while this may be a grievance, how can it be remedied? How many sanitary engineers can afford to stock the amount of goods necessary to adequately display the enormous kind which are in constant demand? When the manufacturer or jobber does this, he cannot shut out the public. He must be courteous, etc., and in fact he is the one in reality who is creating the demand for better and more up-to-date goods, and if we compare the amount of goods sold to the actual householder or owner direct

with the amount disposed of to the trade one could scarcely notice it. So let us study up the different grievances and a way to eliminate them. Then meet our jobbers and we feel sure they will meet us with anything in reason.



EDITORIAL COMMENT.

The "Sanitary Engineer" has been asking the opinion as to the possibilities for the **Plumber**. Some think he has great chances to become a **Sanitary Engineer**, while others stated his chances of becoming a professional commodity were very slim. The latter's idea does not hold good when we remember that

* * *

Wanamaker's first salary was \$1.25 a week.

* * *

Cornelius Vanderbilt began life as a farmer.

* * *

A. T. Stewart made his start as a school teacher.

* * *

Jim Keene drove a milk wagon in a California town.

* * *

Geo. W. Childs was an errand boy for a bookseller at \$4.00 a month.

Jay Gould canvassed Delaware County, N.Y., selling maps at \$1.50 a piece.

* * *

Andrew Carnegie did his first work in a Pittsburgh telegraph office at \$3.00 a week.

* * *

Whitelaw Reid did work as correspondent of a Cincinnati newspaper for \$5.00 a week.

* * *

The plumber is ahead of all as far as opportunity goes though he will always be more of a philanthropist than any of the above mentioned.



While a salesman is talking to one man a good advertisement is talking to the trade.

* * *

A bright smile makes customers. Not one which by constant use has become cast iron, broad and more commodity were very slim. The latter's idea does not like the grin of a pet cat, but a smile from the heart, with a good honest grip of the hand.

Should the Main Drain Trap Be Abolished?

Practical Discussion on Various Conditions Under Which Main Drain Traps Can be Used—Also on Disadvantages Through Use of Trap—Written For Modern Sanitation by J. J. Cosgrove.

Since the main-trap was introduced into plumbing practice it has caused more discussion and awakened more controversies than any other part of the drainage system. Those who are in favor of the main-drain trap point out that it is a safety device which cuts off each separate drainage system from the street sewer, thereby preventing the pipes within the building from being charged with sewer air from the street mains. They object that, if the main-trap were removed, the soil and waste stacks in each building would become sewer vents, and protest that individuals should not be made to ventilate the public sewers through the roofs of their buildings, but that special provision should be made for the purpose.

The opponents of the main-drain trap, on the other hand, contend that the sewers would be much better ventilated if the main-drain trap were omitted, and claim that interposing a trap where the house drain enters the building invites stoppages at this point, besides fouling the house drain by checking the flow of sewage toward the sewer. They are sweeping in their condemnation of what they consider an unsanitary device and wish to simplify the construction as well as reduce the

cost of installation by prohibiting the main-drain trap and its complement, the fresh air inlet.

So far it does not seem to have occurred to the controversialists that both may be right, yet such is the case. Whether or not a main-drain trap should be used is an engineering problem which must be worked out in each city after a full and careful consideration of all facts bearing on the case; and the main-drain trap might be desirable in one city, while its use would be objectionable in another not many miles away.

To clearly understand under what conditions a main-drain trap is necessary the function and object of the main-drain trap must be understood. By interposing a water seal where the main house drain enters a building the impure air from the street sewer is shut off from the drainage system; then, by installing a fresh-air inlet, circulation of air within the drainage system is maintained, so that a collection of deleterious gas is impossible and a leak in the drainage system would prove harmless. Of course, it will be readily understood that if the air in the street sewers were as fresh as that in a drainage system provided with a fresh-air inlet there would be no necessity for the

use of a main-drain trap, for the air of the sewers would be no more objectionable than that in the drainage system, and it would be poor engineering practice to interpose an obstruction of any kind, however slight, in the drain unless it performed some good office. Further, it would entail an extra cost for the main-drain trap and fresh-air inlet, without a compensating advantage, besides necessitating a fresh-air inlet, which sometimes belches forth unpleasant odors in close proximity to doors, windows and porches.

There are several different conditions under which the use of main-drain traps may be considered, whether or not the traps should be used depending on the conditions which obtain in each case at the time. For instance, there are the cities where sewer systems are just installed and drainage systems are about to be connected to them; next, there are old sewer systems which have been in service for many years in thickly populated cities and already connected to the drainage systems of most of the buildings in the district; finally, there are the problems connected with the installation of sewers and drainage systems in extremely cold climates.

(Continued on page 25.)

CONVENTION SIDE LIGHTS

The 18th Annual Convention was as fine a sample of Roughing in as one could desire. It stood the **Smoke** test, water and other stronger tests and when completed will be one of the finest systems of sanitary heating and ventilating ever accomplished and no fixtures in the system but all go-ahead fellows and no mistake.

A very interesting and pleasant event took place in Room 504, at Queens Hotel, where the Western delegates were the guests of the Eastern delegates. They all "Butted in" with some of their past experiences pleasant and otherwise. But the main features of the evening was as follows and took them till the "wee sma oors o' the mornin'" to get through.

Programme.

Marr. Scottish Solo. "But no' So-to Ye Ken."

Roantree. Comic Experiences. "Which was 'na roon a tree aither mon."

Frankland. Buck and Wing Dance. Mair Bucking then winging you bet.

Frost. Address on Technical Schools, and would be instructing to the bunch there.

Shea. Comical Experiences in Montreal, and we know he had 'em yer ken, cause they aye lasted till the morrow be-gorra.

Dorman. "Master of Ceremonies." Na doot the Bunch he had needed a Boss-tee.

Crawford and Watson. Refreshment Committee.

Godwin. Address on Association Work.

Fullerton. Accompanist and aye in mair ways ner yen, ask Frankland aboot him behind and before the bars.

Messrs. Jas. Robertson Co., Ltd., presented each person who attended the convention with a beautiful souvenir in the shape of a pencil made up in different colors, along with nickel plated case of re-fills for same. The J. R. Co., Ltd., are known to be always on hand with a good thing whether on business or pleasure bent.

The Thos. Robertson Co., Ltd., presented the ladies accompanying the delegates with boxes of chocolates at the *Orpheum Theatre* on Tuesday evening. The play "Virginian" was very ably presented by the "Orpheum Stock Co." and judging from the smiling faces of the delegates especially of "Frankland from Ontario," they one and all had a most enjoyable evening.

The following is a list of guests who took in the trip around the harbour.

Benj. Noble, London, Ont.; S. R. Brew-er, Montreal; H. A. Lamontagne, Mon-treal; Walter Ryan, Montreal; Edw. Holland, London; P. Lergie, Montreal; J. J. Doyle, Montreal; Jno. Watson, Westmount; W. P. Baxter, Montreal; Jno. J. Laferme, Montreal; R. W. Har-ri-son, Toronto; Jos. Harrison, Tor-onto; Jos. Thibeault, Montreal; Jos. J. Slater, (Plumbers), New York City; Wm. Skelly, Jr., London; E. L. Way-man, Port Hope; Ernest J. Laidlaw, Toronto; Jas. R. Haslett, London; C. F. Needham, London, Ont.; J. Hainsworth, Berlin; Harold M. Reid, Montreal; Ed-win Newson, Toronto; H. C. Lowrey, Montreal; W. Isreal, Berlin; J. F. Bir-chard, Toronto; Geo. Ross, Brockville; C. S. Fowest, Montreal; L. J. Conroy, Montreal; A. W. Lamontagne, Mont-real; Jas. Griffen, Montreal; R. J. Mc-Cauley, Montreal; A. W. Gardner, West-mount; Chas. M. Webb, Toronto; John Eggett, London; Jas. A. Sodler, Mon-treal; A. J. Hoolahan, Montreal; Alex. Charette, Montreal; H. M. Drum, De-troit; Garrett F. Frankland, Toronto; J. M. Collins, Montreal; Jno. A. Gordon, Montreal; Oswald J. Delaney, Montreal; F. P. Senecal, Montreal; W. J. Wall, Montreal; J. E. Fullerton, Toronto; Jos. Brunet, Pres. Builder's Exch, Montreal; Alex. I. Mearns, Montreal; J. Thorp. Blyth, Ottawa; J. Marr, Calgary; C. R. Frost, Edmonton; Geo. S. Dorman, Moncton, N.B.; J. E. Walsh, Montreal; Jno. E. Godwin, Halifax; W. J. Craw-ford, St. John; N. B. Roantree, Swift Current; Walter W. Maguire, Mon-treal; D. J. Shea, Fredericton, N.B.; J. P. Lamarche, Montreal; A. E. Gibbons, London; Harry F. Cole, Montreal; W. E. Potter, Montreal, representing Mas-ter Painters' Association.

QUESTION.

To set at rest some little rift in the Lute of Conventionality The "Sanitary Engineer" would like to know the aims and objects of the new Western Society, so as to be able to publish them throughout the Dominion in an early issue.

Joseph Thibeault was a power for good at the convention. And gave out some good food for thought in his address. His personality should be felt in Montreal where he is in daily contact with his fellow craftsmen. He is a man who has come to realize the responsible position the Sanitary and Heating En-gineers hold in the community and is out to show the public that we as a craft

are far ahead in professional dignity than any other line or calling. In his address and later he was not slow to voice his feeling at the way the public juggle with the time of the Sanitary Engineer and showed one of the reasons for high cost of the work, being the time wasted by being called to look at this or the other job, giving estimates, drawing plans, etc., only to have his prices and plans peddled from one to another to get the cheapest price. He pointed out where many a month's time is so frittered away. This time has to be charged up to overhead expenses. But how often is the real value of the time charged up? It it were, the charges would be higher. If the medical pro-fession can make and collect a charge for advice why not the "Sanitary En-gineer?" If they were called in more frequently and their advice acted upon the visits of the medical man would be less frequent and a fine thing it would be if both professions met more than they do so as to form a more mutual union of prevention and cure.

The delegates to the convention were presented with souvenir pencils by The Jas. Robertson Co., Ltd.

* * *

CRUISE AROUND HARBOR.

A feature of the convention never to be forgotten is the cruise round the har-bor and the way the worthy captain and officers catered for all aboard. Special mention may be called to the able way Capt. Bourassa demonstrated the differ-ent features of the work. Completed and in course of construction in and around the harbor of Montreal, and the "Sir Hugh Allan" too is a craft of no mean order. The party were all served with refreshments and three cheers were given to the Harbour Commis-sion-er of the City of Montreal and three more for the worthy captain when all joined in "He's a Jolly Good Fellow." and He IS.

Fullerton's head gear had a race with its owner in a rush to get on board, but got its enthusiasm dampened by a cruise of its own in the cold wet water of the St. Lawrence, and unlike the rest of the party who got a wetting on board, it got a drying.

The Supply Men certainly have the opinion that a hard bunch was to par-take of the dinner. Just fancy a fellow having to digest such a menu. One would have to possess a set of dietary organs which would amount to a con-glomeration of foundry, pottery, plat-ing and machine shop.

SHOULD MAIN DRAIN TRAP BE ABOLISHED?

(Continued from page 23.)

Each year, throughout the world, numerous cities construct sewer systems. If at that state of proceedings the subject is given proper consideration the problem of whether or not to use main-drain traps will right itself. When the sewer system is completed the pipes and conduits are perfectly sweet and clean, no organic matter, outside of that contained in the ground water which seeps in, having passed through them. If, then, the use of main-drain traps is dispensed with in such cities each drainage system connected to the sewer will serve as a vent, and as the area of the various house drains will far exceed the area of the main sewer and possess hundreds of times the capacity of the main street sewers it will stand to reason that the air within both the street sewers and the drainage systems will be as pure, chemically, almost as the air of the streets, and far more fresh than in a drainage system cut off from the street sewer by a main-drain trap and provided with a fresh-air inlet.

Take, for instance, a concrete example: In the city of New York 25 feet front is considered a city lot, and on each lot there is erected a building. These buildings are all connected to the main street sewer with either 5 or 6-inch house drains. In a block, then, 200 feet in length, counting both sides, there would be a total of sixteen vent pipes 5 inches or more in diameter, with a combined area of 314 square inches, assuming that they were all of the smaller size. Outside of main sewers and trunk sewers 18 inches would be considered a good size for a branch street sewer. Perhaps 12 inches would be a fair average; but, assuming a street sewer to be 18 inches in diameter, it would possess an area of 254 square inches, or 60 square inches less than the combined area of the house drains connected to it. Just consider the ventilating effect of such a system if the main-drain traps were omitted. To each block of street main there would be a combined area of ventilating flue larger than the street sewer. Look at it in another light: In each block of 200 feet there are sixteen house sewer connections—that is, for each 12½ lineal feet of sewer there is a 5-inch vent pipe extended above the roof of a building. If two 80-gallon galvanized iron range boilers were placed end to end they would show, graphically, the small portion and size of sewer that would have to be ventilated by each 5-inch house sewer and vertical stacks. If, then, when a new system of sewers is laid out in the city, or if when an old system of sewers is extended to a new district,

that city or district did not require the installation of main-drain trap, the street sewer would be better ventilated, the air in the drainage system would be purer; the construction would be simplified; the installation cheapened; and from a sanitary and engineering standpoint, the system would be better than if main-drain traps were used. There would be no water seal to check the flow or invite stoppage at the front wall of the building; no foul air would be discharged from the mouth of the fresh-air inlet, and, as the air in the sewers would be almost as fresh as that in the streets, interposing a trap would prevent circulation and allow the accumulation of gases of decomposition and fermentation. It may be laid down, then, as a rule which may safely be followed that the main-drain trap is better omitted in all cities where new sewers are constructed, or in those sections of old cities to which sewer systems are extended.

In closely built-up city districts conditions might or might not be different, depending on the system in vogue up to that time. If main-drain traps and fresh-air inlets have not been used in that district or have been used only in special cases the conditions would be the same, almost, as if a new sewer were just put in; and if the various drainage systems are well ventilated by stacks extending through the roofs, and perforated manhole covers are provided at intervals along the line of the street sewers, there is no good reason which can be advanced why main-drain traps should be insisted upon. Omitting them in all cases where drainage systems are subsequently installed will insure a better ventilation than obtained before, while installing main-drain traps would tend to the strengthening of the air by the various systems contributing their share of organic matter to the sewers without carrying off the proportionate share of gases.

If in the closely built-up districts main-drain traps have been the order and all or most of the drainage systems are provided with main-drain traps and fresh-air inlets conditions probably would be different. In that case it is probable that the concentrated gases in the street sewers would be stronger than in the drainage systems cut off by main-drain traps and provided with a plentiful supply of air. Under such conditions, then, it would seem the better practice to require the installation of main-drain traps, but even then it is questionable if the practice could be approved unless a chemical analysis of the air of the sewers demonstrated that it was not only stronger, but enough stronger than the air in isolated drain-

age systems to warrant such a requirement.

If in closely built up districts where main-drain traps are required the surfact of the streets is paved with asphalt or any other impervious material the requirement of main-drain traps must be approved. Under such conditions leakage of illuminating gas from the gas mains will charge the main sewers with an explosive mixture, which can best be kept out of the drainage system by interposing main-drain traps in the house drains. Indeed, there are conditions under which main-drain traps are desirable even in cities where, as a rule, they are not installed. In the vicinity of gas works, chemical works or garages, where chemicals or gases either of a poisonous or explosive nature are discharged into the street sewers, the better practice would be to require main-drain traps within certain limits, so that the inflammable or dangerous gases would travel some distance and become sufficiently diluted with air to be harmless before being permitted to pass through a drainage system. It will thus be seen that not only must the problem of whether or not to use a main-drain trap be worked out for each city, but, furthermore, it should be considered when designing every plumbing system.

The practice of following blindly a method adopted in another locality cannot be approved, and copying of plumbing codes by one city from another does not always give the degree of satisfaction that would be obtained by remembering that every installation is a law unto itself, and the conditions which are obtained in one city are seldom or never exactly similar to those in another.

In very cold climates, such as the northern part of Canada and the United States, where a blanket of snow lies on the ground during several months of the year, an entirely different set of conditions is presented for consideration. In such climates the perforated covers used on the top of sewer manholes for ventilation are of little or no use during the cold weather. Snow falling on the covers is melted by the heat of the gases within, the water freezes and the breathing places for the sewer are completed stopped. The stoppage of the manhole covers then becomes apparent in two ways: as air cannot escape from the sewers when the various discharges are entering there is a tendency for the drains to be air bound, which becomes noticeable in some sections more than in others; and in the second place, as there is no ventilation or circulation of air through the sewers, the gases become concentrated and dangerously strong, particularly if

there be an infiltration of illuminating gas.

This can all be avoided and the double purpose effected of ventilating the sewers (which nominally is a municipal duty) and decreasing the cost of installation by omitting the main-drain traps and allowing the sewers to breathe through the vent stacks above the house tops. Under such conditions there is no gainsaying that main-drain traps are a menace to the safety of the citizens more than a safety appliance, and in cold climates, where the manhole covers are liable to be covered with ice, the better practice by far is to omit entirely the main-drain traps and allow the drainage systems to vent the sewers. This practice is often objected to, not from sanitary motives nor for structural reasons, but on the political grounds that no man should be made to ventilate the street sewers through his private property when ventilation of sewers is a municipal duty. This position, however, is untenable as well as unreasonable. If property owners were required at their own expense to run a special pipe through the roofs of the buildings for the sole purpose of ventilating the sewers the objection would be better founded, but even then would not be wholly reasonable. But no such unreasonable demand is made upon them. On the contrary, instead of increasing the cost to the householder by omitting the main-drain trap and doing away with the fresh-air inlet he is saved a considerable sum, and a good citizen should not object to incidentally bettering the conditions of a public utility when by doing so he not only better his own condition, but effects a saving at the same time.

Even though there were no saving effect, but that, on the contrary, it imposed an extra financial burden on the property owner, the city would have the right to ventilate the sewers through the soil and waste stacks of the various buildings. At public expense and for the benefit of the entire community the sewers are constructed. If a householder then wishes to avail himself of the benefits of the sewers he is entitled to that privilege, provided, and only provided, he does not exercise the privilege to the injury or inconvenience of others. By discharging his impurified sewage into the street sewers, without making provision to take care of an amount of gas equal to that arising from the decomposition and fermentation of the sewage he (the householder) imposes this extra burden on his neighbors or on the community at large. That being true, the community is privileged to deny to one individual the rights of a community unless he will act in an unselfish man-

ner and bear his share of the burden of ventilation.

But it is the engineering more than the political features of the case that we are most interested in—whether the main-drain trap can be omitted without weakening the system, not whether the householder can legally be compelled to use his drainage system as a vent for the street sewers. From all the evidence at hand it would seem that in most cases the plumbing work would be bettered from a sanitary standpoint, simplified from a construction standpoint and cheapened in the installation by omitting the main-drain trap and doing away with the fresh-air inlet, while the condition of the public sewers would be vastly improved thereby. That being true, the question naturally arises, should the main-drain trap be prohibited? The answer to that question is unqualifiedly No, for even in cities where main-drain traps are not used conditions might be such in some cases, as previously pointed out, that traps would be desirable, and if any such conditions arose it should be within the discretion of the designer to use one, or not, as his judgment dictated.

On the other hand, the installation of main-drain traps should be required only in the exceptional cases where chemical analysis has demonstrated that the air of the sewer is much stronger than that of the drainage system. Even then judgment must be exercised, for if that condition of affairs obtained in a very cold climate where the sewer vents are closed in the winter, instead of aggravating the evil by requiring main-drain trap it might prove advisable to require the removal of the traps already installed, even though the work had to be done at the expense of the municipality.

Generally speaking, the main-drain trap has outlived its usefulness. It was ushered into practice early in the history of modern plumbing design, when sewers were not as well scoured as at present and the drainage systems within buildings were not as thoroughly ventilated. At that time they did untold good; but time progresses and plumbing practice must progress with the times. To that end it is well to hold up to view different parts of plumbing installations, examine them closely and analyze the functions carefully. Then, if found wanting, drop them from practice.

TO IMPROVE SANITARY CONDITIONS.

Galt, June 3.—Galt has spent \$300,000 on a sewage system, but during the period of ten years' existence only ten per cent. of available users employ the

service. Strong public feeling among citizens has been aroused by recent revelations affecting sanitary conditions, and at the council the opinion was expressed that the medical health officer be urged to use the power vested in him to compel universal adoption of the service in all streets supplied therewith. Dr. Vardon personally strongly favors some measure of compulsion, but is restrained from drastic steps in view of the hardship to many persons unable to bear the large outlay involved.

Comments on Above.

The general public of Galt may well be aroused when one notes by the above item that only ten per cent. of the people are using their fine \$300,000 sewerage system and it's certainly up to Dr. Vardon to investigate the financial matters of those who are not using the system. We are our brother's keeper in cases like that and possibly some of the unsanitary conditions of those who do not use the sewers would be the cause of trouble and sickness to their neighbors around who are using these sewers.

They are thereby a menace to the general public. Further, it reflects no credit to the city of Galt to allow its surrounding towns and cities to know that only ten per cent. of the people of Galt can afford to live under good sanitary conditions and 90 per cent. are too indifferent to avail themselves of a \$300,000 sewerage system for which they (the people as a whole) have paid for or are paying for. Dr. Vardon has our sympathy and we know there are other M. H. O. in the same predicament.



TWO THOUSAND SAMPLES REPORTED UPON

Brockville, Ont.—“F. A. Dallyn, B.A., S.C., provincial Sanitary Engineer and his staff, have completed the tests made of the water taken up in district which were upwards of two thousand samples. Dr. W. R. Jaffray and C. A. Avery, B.A., S.C., assisted in the work. Dr. Jaffray made all the tests of water from Gananoque to Ogdensburg. The staff have now left for Niagara-on-the-lake where the taking of samples and testing same will go on.”

The “Sanitary Engineer” is interested in this good work and feel that when the public at large become acquainted with the state of affairs regarding the pollution of our beautiful lakes, rivers, and navigable waterways they will want to know which is the best and most sanitary method of sewerage disposal and it will be up to our sanitary engineers (not plumbers) to be able to have the information at hand. So they need to get busy. We will help some, if they inquire.

Sewage Disposal for Country Residences

Simple Methods of Constructing Septic Tanks Described—The Installation of Cesspools is Against the Law—Pollution of Waterways is Provided Against in Report of Senate Committee.

Various forms of Septic Tanks have been constructed and in operation for some years. But of late years, marked improvements have been made which have proved their efficiency over old styles. Fig. 1 is a form of tank operated by what is known as a Miller Automatic Syphon and operated in the following manner. First, the sewage from the house fills the septic portion of the tank which then overflows as it were through the pipe and bend which is inserted in the partition, the dosing tank then begins to fill, rising in the bell of the syphon and overflowing into the trap which becomes sealed, thus confining the air in space F which forms the long leg of the syphon. As the liquid rises in the dosing tank or chamber it compresses the confined air in the long leg, forcing the water down on the one side and up on the other as shown until the air in F is compressed and thereby causing syphonic action to take place, the air driving the liquid onward and immediately emptying the contents of the dosing chamber.

Fig. 2 shows another form of septic tank which is operated by what is known as the Quinn Valve and is a very popular and simple apparatus. It can be placed two or three feet from the house where the largest number are at present located. It is a tank of two compart-

ments. The sewage enters at E which is terminus of soil pipe from house. This pipe should extend through the roof of house just as if an ordinary sanitary equipment were being installed in a city

soil pipe between the drain and septic tank as a free flow of air is necessary to the good working of the apparatus. The overflow F must be built into the division and made tight. It should go to

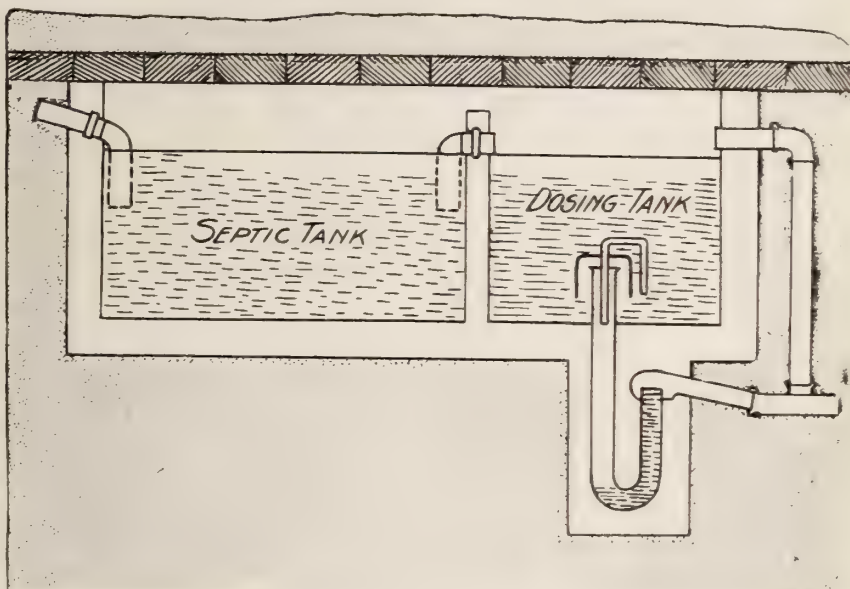


Fig. 1.

home. All the laws govern the same installation except that in a city. The soil pipe would terminate at the main sewer. No trap must be put into the

within 8 inches of the bottom of tank and be screened as per sketch with some durable screening. Galvanized expanded metal about one-half inch mesh or, bet-

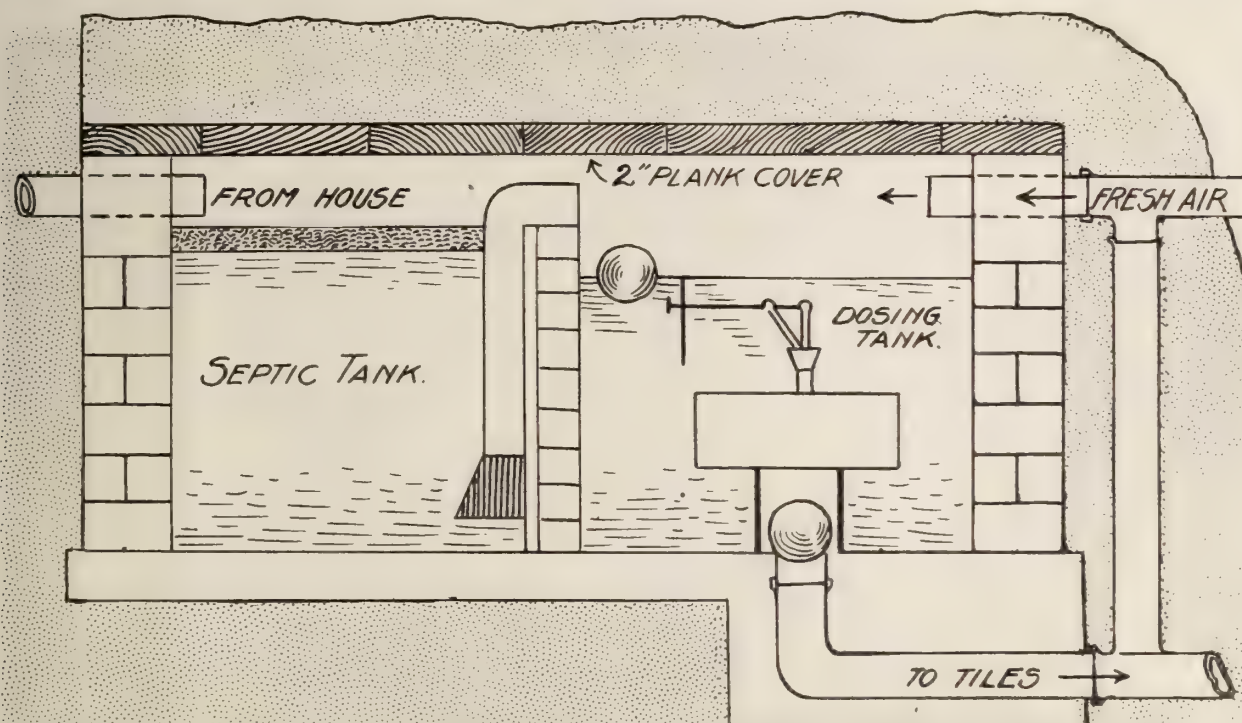


Fig. 2.

ter still, brass and copper wire cloth or screening with $\frac{3}{8}$ mesh. The partition which F is built into should be about two inches lower than walls of tank, so as to allow perfect flow of air from the fresh air pipe. This pipe should be carried to the side of the house and run about two feet above the ground terminating with a cast iron return bend. In tank B. a Quinn valve is placed in centre of tank as shown, the cast iron fitting being a $4 \times \frac{1}{4}$ bend built flush with bottom of tank. The valve has a base which in construction is really a heavy 4 in long brass ferrule, thus enabling the valve being fitted into said $4 \times \frac{1}{4}$ C 1 bend just as any other soil pipe joint. The best method is to make two pouring of lead instead of one and by so doing a better and stronger caulked joint is made. The Quinn valve then operates in the same way as the ordinary W. C. tank valve. The piping marked D. J. and Fresh Air is made up of 4 inch cast iron fittings. Viz.: 1, $4 \times \frac{1}{4}$ bend and 2, 4×4 Tee's or Sanitary Tee Ys.

These should then be connected up to 4 inch tile branches as per Fig. 3 with sizes given. Of course, this plan need not be carried out to the letter, but sufficient pipes in length must be provided to take care of the contents of each flush from the dosing tank or tank B. A safe rule to follow as regards size of tank is laid down in the following manner: For each person residing in the house allow 3 cubic feet area in each tank, and for every foot area allow 13 feet of 4 inch field tile, besides the main glazed tile. These pipes should be laid not more than 12 or 14 inches from the surface with a fall from the tank of half to one inch to every 10 feet. The

joints of these tile should be covered with broken flat stones or pieces of pipe so as to prevent the earth washing into the pipes. If the earth is good, loose loamy ground, a thin layer of broken stones is advisable to lay the tile pipe on. But if, on the other hand, it is clay soil, the trenches should be dug 2 feet deep

the ground to settle naturally, and sod over. This method will be found to work satisfactorily. A question is asked as to whether this method is not liable to freeze. Let us respectfully quote the following from an extract on Sewage Disposal for Residences, issued by Ontario Board of Health in which we

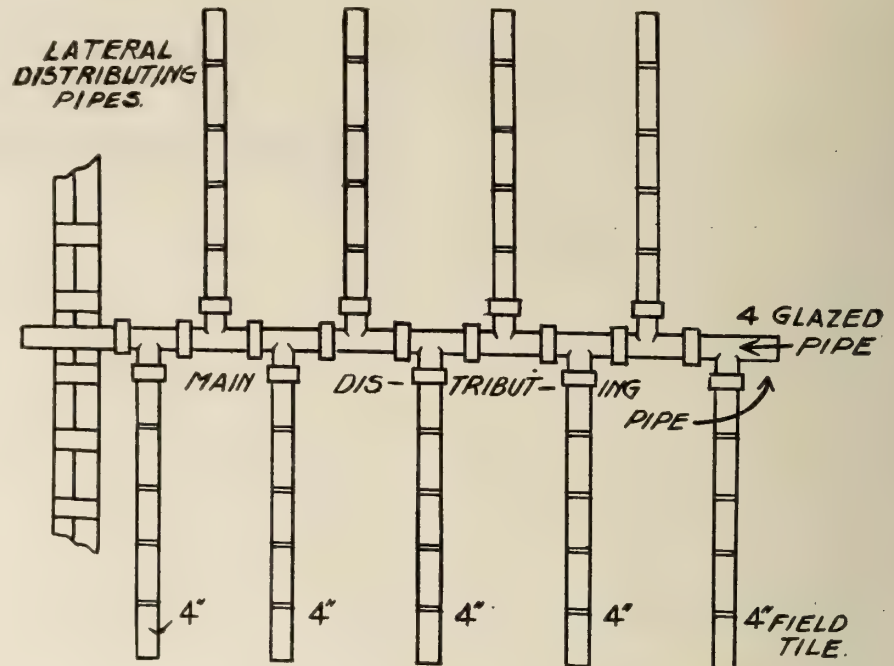


Fig. 3.

and 2 feet wide, filling up to within 12 inches with coarse gas coke or broken stones about the size of an egg. Then lay the pipe and fill up to level of top of pipe with coke or stones. A layer of straw about an inch deep should then be used. Then fill up trench and allow

presume Dr. McCullough says:— "In answer to a question which arises in the minds of most people who have given consideration to the system, I may say that it will not freeze in winter, even when the frost penetrates the ground for several feet."

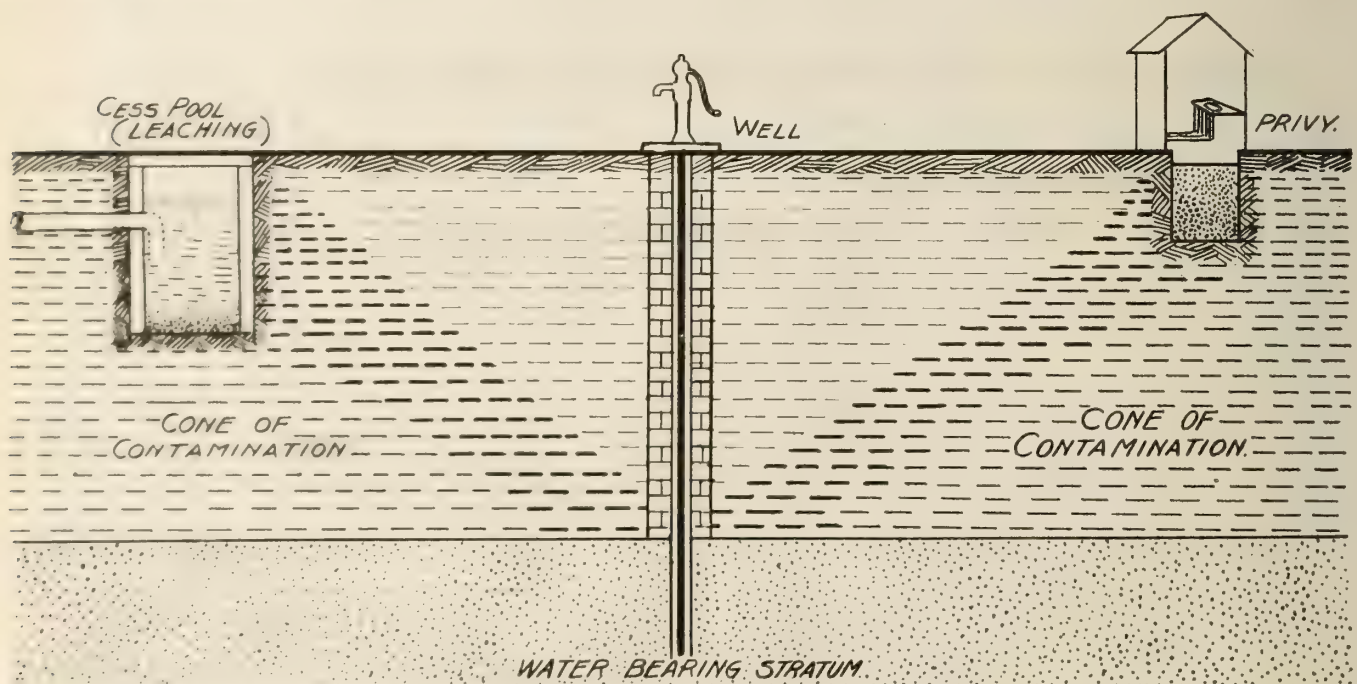


Fig. 4.

In conclusion, care should be taken to have the tank covered with plank which fit tight, then about 6 or 8 inches earth on top and sodded if it is desired, and lastly, care must be taken not to use any disinfectants of any kind as these chemicals are sure to kill the germs which are necessary for the purification of the sewage.

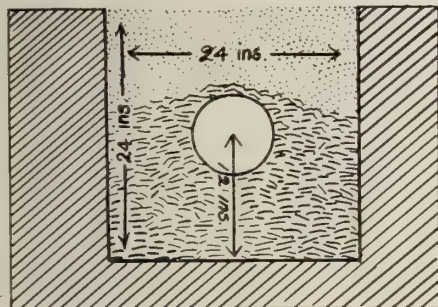


Fig. 5.

Fig. 4 shows the line of contamination caused by privy vaults and cesspool, which speaks for itself as being a very dangerous as well as an illegal method of sewage disposal.

Figure 5 shows size and kind of trench to dig, also method of placing tile pipe.

A SIMPLE METHOD OF WATER PURIFICATION.

Drs. G. G. Nasmith, Esq., Ph. D., and R. R. Graham, M.B., of the Laboratory of the Provincial Board of Health, have issued the following Formula for Purifying Water.

A level teaspoonful of chloride of lime should be rubbed into a teacup of water. This solution should be diluted with three cupfuls of water, and a teaspoonful of the whole quantity should be added to each two gallon pail of drinking water. This will give .4 or .5 parts of free chlorine to a million parts of water and will, in ten minutes, destroy all typhoid and colon bacilli or other dysentery-producing organisms in the water. Moreover, all traces of the chlorine will rapidly disappear.

This method of purification has been tested with Toronto Bay water inoculated with millions of bacteria. Every germ has been destroyed and it has been unnecessary to boil the water.

This method should be very valuable to miners, prospectors, campers, and those living in summer resorts where the condition of the waters is not above suspicion.

A VALUABLE BOOK.

"The Sanitary Engineer" is in receipt of "Hot Water Supply and Kit-

chen Boiler Connections," by Wm. Hut-ton. This book is one which every sanitary engineer should have on his book-shelf. It treats the different methods of connecting range boilers in no small manner. It is simple, and has none of the highly technical phraseology so often found in books of its class. The illustrations are simple, very original and unique. Its 14 chapters are full of the most useful information, and reflect great credit on the author.

NEW CATALOGUE.

The Pressed Metal Radiator Co., of Pittsburgh, have issued a very interesting booklet demonstrating the quality and lightness of their pressed metal



radiator, cut of which shows one man carrying a radiator of ordinary size, while it requires four men to handle one of the same heating surface.

IMPORTANT CHANGES IN PEASE COMPANY EXECUTIVE STAFF.

Mr. Ross recently resigned the position of treasurer of this company, which he has held for many years, and, while still a director of the company, has retired from active service.

R. B. McKinnon, who for the past two years as sales manager has so suc-

cessfully reorganized and improved the selling organization, succeeds Mr. Ross, taking the title of treasurer.

R. J. Millar has been appointed in charge of the Ontario sales department. Mr. Millar has for the last seven years represented the Pease Foundry in Southern Ontario with great success.

Mr. Millar's place in Southern Ontario will be filled by J. F. Alexander, formerly manager of the Babcock & Wilcox Co., Toronto office, and will be a strong addition to the Pease Foundry staff.

LUCKY THIRTEEN FOR PEASE FOUNDRY, LTD.

On Friday, June 13, thirteen members of the Ontario selling staff of the Pease Foundry Co. left on the 1 p.m. train for Brampton to visit and inspect the new large modern works of this company recently completed.

The party consisted of the following members of the staff: R. B. McKinnon, treasurer; R. J. Millar, chief of the sales department; Jeff Hunter, J. F. Alexander, Jack Clarke, R. H. Cole, A. Ramsay, W. C. Scott, A. M. Bond, A. H. Power, W. J. Faulkner, L. V. Dixon, Fred Simpson and George Brydon.

The new plant of the Pease Foundry Co. at Brampton is most modern, devoted exclusively to the manufacturing of heating apparatus. It brought forth great expressions of amazement and appreciation from the visitors.

They were shown various methods of construction of Pease heating devices from start to finish, commencing with an ingot of raw iron and steel.

After the inspection the party adjourned to the "Victoria Hotel," refreshed the inner man, and returned on the eight o'clock train to Toronto.

THE PLUMBER

Does the Plumber wear his diamonds,
Because you think his bill is high,
Let me say it is a fallacy in fact it is a lie.
For it's me that is a Plumber and you find them in the ditch,
And they dig away a life-time in their efforts to get rich.
The money that he gets from you and which you think
he swipes — Doesn't go for buying diamonds
but is spent for buying pipes

New Sanitary and Heating Goods



Fig. 1.

National Equipment Co., 263 So-rauren Ave., Toronto, have just completed three new water supply systems, each one has quite a few new and original features never before used in systems of their class. Fig. 1 is a system which is driven by electric motor and worm drive. No belts, shaft or pulleys required, they claim it will supply — gal. per hour, is automatically controlled by the simplest contrivance, by the unscrewing of one nut and bolt the whole interior of the pump is exposed to view. The motor, pump and all other mechanism is on one solid base. It is double acting, fitted with brass seating and rubber faced valves with double retraction bronze springs.

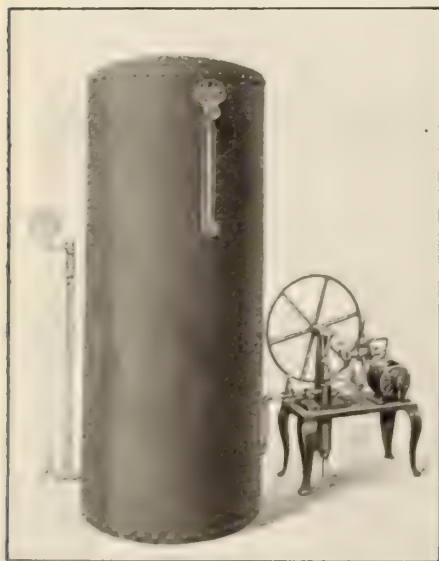


Fig. 2.

Figure II. is a very unique equipment of water system will supply 125 gal. of water per hour. Specially designed for domestic use. They claim this system is the only one of its kind. It is fitted with ball bearing, is double acting, and automatically controlled. The whole apparatus is fitted on one solid base, with motor pump electric switch which is governed by the pressure in the tank, This switch is the most simple contrivance consisting of two small diaphragms which operates just the same as the ordinary switch of a lamp. The pump is brass lined and of very effective kind and positive in action.

Figure III. This water system which looks rather familiar, is not like any other before put on the market. It is operated by hand. The pump is a very effective type and is fitted with geared

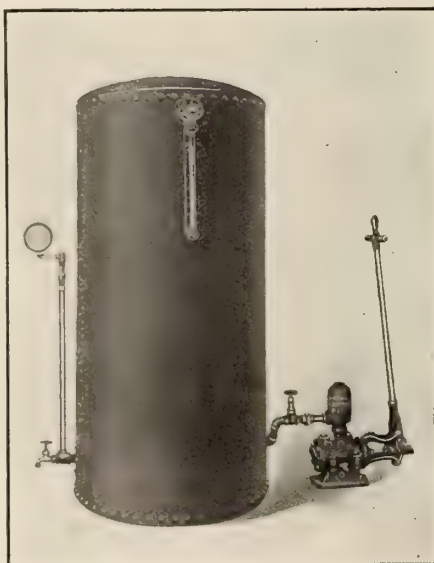


Fig. 3.

piston. There is no air pump in connection with this system as was supplied with any of this kind. They claim they have been able to dispense with this air pump by using a very simply constructed valve which allows air to be taken up and forced into the tank with the same stroke as when pumping water. Thus ensuring a proper quantity of air with each portion of water pumped in at every stroke.



1913.

This is proving to be no Hoo-Doo year judging by impressions got at the different conventions already held and any others still to be held will have to GO. Some to keep it up. Lets hope they do.

ANNUAL EXCURSION TO PETERBOROUGH.

U. A. Local Union 46, Plumbers, Steam and Gas Fitters will hold their annual excursion to Peterborough on Saturday, July 26th, a hearty invitation is extended to those in the trades and their friends to come with us on that date, tickets are good to return on 28th, there are many points of interest in Peterborough, amongst which is the Lift Lock which cost half a million dollars to construct.



NO PLUMBING BY-LAW IN LONDON, ONT.

"No "Plumbing By-Laws" in London, Ontario, yet we find that Sanitary Engineering in London is of no mean order. They have a Master Sanitary Engineer on the Board of Health and have formed a class at the Technical School to teach Sanitary Engineering to those who are practicing it. So while not having the law they are certainly reaping the profit by the standard of work being actually done in London.



STRANGE RUMORS.

"Say, what's this we hear," That some city or cities actually enforce the connecting of all refrigerator traps to the sewer or waste pipes and also the main-house trap, The Sanitary Engineer would like to know what cities do or don't. Unless our Sanitary Engineering has got an awful dunt we have a feeling that such by-law or laws are wrong.



SCARCITY OF "PLUMBERS."

Plumbers were scarce at the convention but there was a very capable body of Domestic Sanitary and Heating Engineers present which shows the beginning of a new era in the trade. All wore badges to that effect.



BIG ORDER PLACED.

The City of Regina has placed an order with the Canada Iron Corporation of Fort William. The order amounts to 4,000 tons cast iron pipe for the water-works. Shipments are being made daily, and the Canada Iron Corporation plant is running full blast with a staff of 425 on the pay roll.

The Curbstone Plumber: What of Him?

What He Is, What He Might Be, and How He Should Be Handled—Sanitary Engineers Could Relieve Difficulty By Coping With Such Opposition in an Enlightened Way—Only Experienced Men Should Be Given Licenses.

This class of tradesman has been a source of trouble to the business of sanitary engineering since the year one. He is not always a bad fellow. He is practically a man with a great quantity of ambition to better his position, and thinks he knows all about the trade necessary to start on his own account. Generally he is a man without much capital. He is undoubtedly a hard worker, possibly not as efficient as he ought to be. Now much has been said to his discredit, which should not be said, thus almost making him feel he has made a mistake in launching out for himself, and at the same time making every sanitary engineer of old standing an enemy to him. This is not altogether his fault.

We are not taking his part, but rather trying to show how 90 per cent. at least of these men are victims of those in the trade prior to their entering into it on their own account. First, if this business is to be brought up to its own position, it must be well guarded from every standpoint, both for its own and the public's welfare. Then we who are in the business must begin and do a little house-cleaning. When that is done we must keep the house clean. Now, before a man be allowed a license he should first prove that his abilities can warrant that license being granted. We are, of course, referring to the man who starts out from the bottom to actually do the work himself, and not to the man with capital who employs practical men. These men by rights should even before starting have held a journeyman's license from the Municipal Board of Health. Then, having previously held this journeyman's license, he has practically proved himself to be a capable craftsman. Then, suppose he gets his sanitary engineer's license to start in business and his capital is limited. He is known to the jobbers and supply men, and gets a line of credit, and for the first year or two all goes fairly well. He works all the hours possible and up to a certain point makes good, but all this time he is looked upon with bitter feelings of resentment by those in busi-

ness, and often most especially by those for whom he worked for before he launched out for himself. And here comes the bitter rivalry, which is absolutely unnecessary. Why not have a talk to him and show him what the experiences are he will encounter. Show him that, whilst he is his own employer, he is all right, but must put a proper employer's value on his time and abilities, and, failing to do so, is only working for the public and taking all responsibilities, instead of when he worked for his former employer he took NO risks or responsibilities, and often a few meetings with the different employers and himself will make him see his own position, and he will not do half the ridiculous things he does. For instance, if he is made to feel that, in a year or two when he begins to employ labor, his position will be different.

The writer had a conversation with a sanitary engineer recently who had to deal with a "curbstone plumber"—one who failed in business, etc., and then started in business again, and began on the same street to cut prices and do all other uncalled for things. He was a fine workman and all that, but a poor business man. One day they met and began discussing matters. This sanitary engineer brought up the price-cutting subject, and they got down to a good understanding, which resulted in a condition to-day of both doing a fair business at a fair profit.

Don't make this fellow feel he is working against a pack of enemies, but rather friends, and you will find it will all turn out to be a case where only the number of business men have increased.

The next evil is the Credit Evil, and it is one of the most dreaded. How many of these curbstone plumbers would we have if the credit system were put on a good basis? Not many. If the supply men could see their way clear to make it hard for men lacking strength of character in more ways than one this would help a great deal. Then one says: "But often a party wanting a job done will buy the material, etc." Now this question is coming home:

"Where will this party get the material?" Why, from either, and firm in business installing, sanitary engineering or a supply man. Then if the first a price should be charged that would be equivalent to a regular retail price and profit of installation as well. In that way your man, the curbstone plumber, will apply for the goods and you have him right there to talk to and show what he needs to do. Then there is another thing which causes a lot of bitter feeling. You hear from a person that they are able to get a certain quantity of work put in by this curbstone plumber for so much. You begin to figure out and find he is, say, 15 per cent. over actual cost, and you drop 5 per cent. and take the job. There's where a mistake is made. It does not matter a rap what you hear, you should never even figure on the job. If the curbstone plumber is first on this job let him have it, particularly if your inquirer is of the opinion he is being soaked. One of the evils and the greatest is the opinion one has that "if so-and-so can do it for so much, by — I can do it for less." There is where in nearly every instance both are wrong. If everyone in the business would do his share along an educational line to put the whole craft on a sounder footing this curbstone plumber would be a thing of the past.

So let us do some house-cleaning ourselves. Show the powers that be the real state of affairs, and only allow efficient craftsmen to hold the necessary license. Then when he does start in business take hold of him in a firm, friendly matter, and all this bitter resentment and price-cutting will be a thing of the past. Let us close with a question: How is it the foreigner comes to our country, starts selling bananas and strawberries? If you pay 15c a basket to one you are asked the same price all over the city or town, and they don't even know our language. What we want, too, is a deaf ear to the person looking for a job to be done and who gives you the other fellow's price with a hope to get it done cheaper.

WANT OF CARE DOES MORE DAMAGE THAN WANT OF KNOWLEDGE.

—FRANKLIN

Setting and Connecting Range Boilers

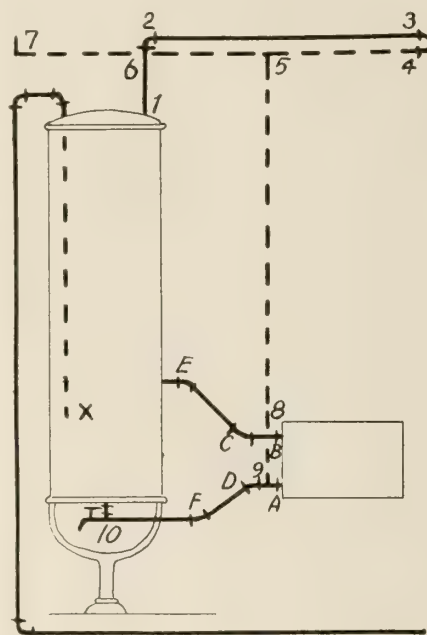
By PHOENIX

CHAPTER 3.

Previously in this series the statement was made that the idea of leaving a long line of dead and cold water lying in the hot water pipe between the range boiler and any of the fixtures (such as the lavatory, bath tub, etc.) was out of date, and we may add that no master who considers himself at all "modern" will allow any such practices. Running a separate supply pipe to every fixture really takes more pipe, generally, than to arrange the job on the circulation plan. In the figure published with this article note the simplicity of the general arrangement, the absence of all sharp turns and the mechanical appearance of the job, taken as a whole. Now picture out how it would look when actually installed and you will have a fair idea of the thing. Why, just giving most any ordinary plumber a good blue print similar to this ought to inspire him to do better work. It has turned out that way in several instances that I know of. In the cut as given here one must not consider that the hot water circulation pipe, "4, 5, 9," must be run identically as illustrated. One's general experience as a workman should convince one that there are many instances where the principle can be carried out, while the pipe lines would be quite different from those shown here. Right here is where many workmen fail. They think that it must all be done the same way; that one job must be built just like another, simply because the first succeeded. The second job fails, and they don't know why it did so. They know how to work all right, these men, but they have failed to grasp the principle which governs the work, and for such people I hope that these articles may bring some light. Sure, pipes is pipes, but they can be strung differently and made to do some queer things, as experience proves every day in the week. Take this drawing as given, and the entire round of the hot water is represented by the figures "1, 2, 3, 4, 5 and 9"; the last figures, "4, 5, 9," being the return pipe to the range boiler and completing the circulation. It is this very pipe last mentioned that throws the average plumber every time by a "toe hold." Really it seems absurd that so simple a matter should get the average workman all balled up, but it does in three cases out of every five. The "Questions and Answers" department of the Sanitary Engineer proves my statement, for in the past three

years there have been plenty of questions from plumbers in business, who have got all mixed up on the circulation of hot water plumbing circulations.

The hot water circulation is nothing more than a prepared course through which the water can run by starting out and returning to the range boiler, less any of its volume that may be drawn off by the side lines which catch the fixtures. Now the moment that any plumber gets that idea into his cranium he will begin to have less trouble in installing these hot water plumbing jobs. The water front is the heart, or generating power, the range boiler the temporary space for the reception of the hot water, and the pipes are the con-



ducting mediums. Thus you see that the range boiler ceases to be a "store house, as it is very often wrongly called. It is, however, a store house when connected according to the old way of doing the work. A "store house" is not the right thing according to the latest practices, and is impractical and also expensive to maintain.

Now, when any plumber has gotten the general principals in his head he will use them and let the rest work out as the occasion requires. I mean by that that he will have a general idea of how the job should be installed, but might not be help to every single pipe on the job. He would not have to, for if the circulation was perfect, the side

lines would take care of themselves, always remembering that the shorter the lines and fewer crooks, the better for all. Such a plumber would, if the occasion required, branch out for himself, from point "3," and there is little doubt but that he would get in the return pipe line back to the range boiler correctly. If necessary, because of the lay out, the return pipe need not be run in at point "9." It could come in at point "10," and would still do the work. If pipe "1 and 2" was, say, from six to ten feet long (as is frequently the case) the plumber might drop from point "4" straight down through the floor to the cellar, run to the point where he could rise through the floor and connect to point "10." Now the side pipe lines which run by the shortest course to the tub, the lavatory, the sink and other fixtures may be taken off the pipe line represented by line "2, 3, 4, 7, and 9." Thus will one be able to almost at once draw hot water from the amount that is circulating constantly in the apparatus as installed. The difference in the amount of water saved, on the average job, in the course of a year's time will amount to quite a tidy sum of money where the water is sold by meter, while the difference in the amount of time necessary to draw the hot water is as about one to ten. It comes almost immediately from an instalment of this description instead of having to wait for some time. In certain hotels I have sometimes drawn off a full bath tub of cold water before I could get any hot water at all. This was entirely unnecessary had the apparatus been installed on the circulation principle. Almost any plumbing job, if laid out along these general lines, should give most excellent results, if the plumber but keeps the general principle in mind and cuts loose from many of the old-time "superstitions."

It would be a mistaken economy to install such a job with one-half inch pipe. There would be no doubt as to the waters circulating, but it would be cut down, and I very much doubt the results being as good as though the lines had been run with three-quarter pipe well reamed.

Now to do work of this character pays well. Such an outfit painstakingly installed will have it all over a job of the old kind, and win the contractor many more in the course of time.

(To be continued.)



The Question Box

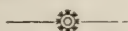


Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

CLEANING THE NICKEL-PLATED WORK.

Editor, Sanitary Engineer,—In lots of houses that I come across the nickel-plated work becomes more or less tarnished. Can you tell me of some good preparation that I can use to clean up this nickel-plated work?—J. Plumber.

We are informed by one that has tried it out that a good article for this purpose can be made from alcohol and sulphuric acid, the proportion of sulphuric acid being about two per cent. of the alcohol. When you have rubbed the plated work with the preparation be sure that you clean it with water and then rub dry with a soft cloth. This should remove the tarnish and restore the nickel work to its former brightness, but will not, of course, put on a polish in any places where the plate may have come off.—Editor.



UNUSUALLY STRONG WATER-HAMMERING.

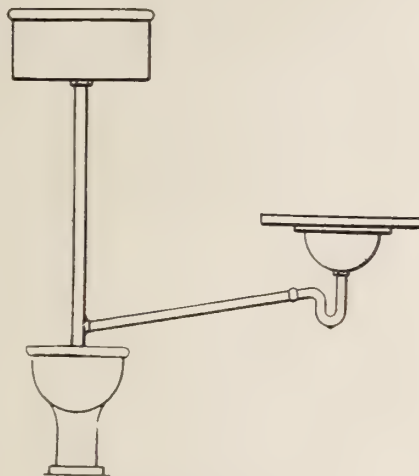
Editor, Sanitary Engineer,—In a job of plumbing that was recently installed the pounding from the water is very strong. It will rattle the dishes on the pantry shelves at times. The faucets are all right and kept in complete repair all of the time. Can you suggest any way to get rid of the noise?—R. H. Jones.

If the faucets are of the Fuller kind, when opened and shut there would be more or less pounding at times. It may be that the water pressure is unusually strong and the pipes in the house too small for the amount of service rendered, which would tend to give you a case of water-hammer. Perhaps the pipes are not anchored properly, and there is an air trap, the resultant somewhere along the lines. You can look the job over with these hints in mind, and if the trouble keeps up write to us again.—Editor.



WHAT ABOUT THIS SANITARY (?) WRINKLE?

Editor, Sanitary Engineer,—What would you think if, in the course of your



Sketch sent by H. H.

travels, you should come across a lavatory and a closet "hooked up" according to the drawing given in letter sent to you?—H. H.

We could not say very much for the sanitary education of the workman who made such an installation. We will not insult the trade by calling him a plumber, for that he sure was not. The sooner people who run in such work are prevented from working at the business the better for all.—Editor.



RANGE BOILER DON'T GIVE ENOUGH HOT WATER.

Editor, Sanitary Engineer,—I am sending you the manner in which a certain range boiler is connected. It does not seem to give much hot water. Can you tell me what is the trouble?—A Plumber.

Judging from the drawing which we show in figure 2 the pipe lines are all right, and should do the work as far as heating the boiler is concerned. It may be that you have too large a boiler for the capacity of the water front. Again, the pipes may have become stopped up. If the boiler is larger than 50 gallons we should be inclined to try a smaller range boiler on the same connections and believe that better results would be shown.—Editor.

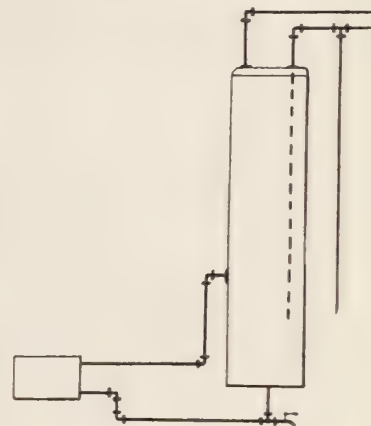


Fig. 2.

SOIL DON'T WORK RIGHT.

Editor, Sanitary Engineer,—I am just starting in to learn the plumber's trade. The other day they had me make up some soil and it don't work right. They told me to find out for myself what was the matter. It all cracked off.—Apprentice.

You have too much glue in it. Work it down by adding more of the other ingredients. Perhaps you did not have the glue thoroughly dissolved in the first place. It should be thoroughly so done in boiling water before the lampblack is added. Just cut loose for yourself, son, and make experiments. Probably that is the reason why they told you to find out for yourself. You know in the plumbing trade one has to, many times, tackle problems the like of which they have not met before. This won't bother when one gets the principle in mind. Learn to make experiments for yourself and your progress will be faster.—

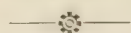


HEATING BY THE FAN SYSTEMS.

Editor, Sanitary Engineer,—Can you find time to tell me very shortly some of the differences between the different systems of heating by fans?—Y. Y. G.

Speaking in a rather general manner, there are two principal ways. In one the air is first passed through a tempering coil, and then taken by the fan and passed through a heating coil. In

others, the rooms are heated by direct radiation, and the fans send the air to the rooms for the purpose of ventilation.



"SENDING HOME" THE PIPE FITTINGS.

Editor, Sanitary Engineer.—I had a talk one day last fall with a fitter who blew through this berg, and he told me a man was a fool to waste time with a wrench in screwing the fittings on pipes. "Take a piece of pipe or a club and smash 'er home," says he. I had a chance to try it out not long ago and I broke more than half the fittings I tried to screw on. Have you any suggestions to make?—Junior.

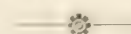
It was not anything new that he told you, as we have seen this trick performed many years before. As a general thing it is not a good thing to do unless the pipe wrenches are to the bad and one can't get hold of good wrenches. The pipe wrenches are adjusted as to length and size so as to apply about all the leverage that a fitting will stand. Now when you take a piece of pipe much longer and go after the fittings post haste with the idea of making them home you stand the best chance in the world of spoiling many uselessly. When using the wrench you can tell almost to a certainty just when to stop. With a pipe and the extra leverage this is a difficult thing to do, although we have seen some who claimed that they could so do.—Editor.



PICKING THE BOILER FOR THE JOB.

Editor, Sanitary Engineer.—I have several jobs of heating to be put in and am not exactly satisfied with the choice of the heating engineer as to boilers. How can I acquire the information?—Builder.

Boilers are just like folks in some respects. You have fat boilers, thin boilers, angular boilers and boilers with the most enticing curves, and if you are not on to them all it is almost as puzzling as to pick a winner in the marriage market. You have got to pick 'em for the job required, both boilers and folks. Experience is about the best teacher, and if your heating man is one of long years in the business and is responsible, we believe that the very best thing you can do is to let him go ahead and not try to crab the game by setting your amateur judgment against his sage counsel of experience. Editor.



CLEANING BADLY STAINED CLOSET BOWL.

Editor, Sanitary Engineer.—One of my customers has a closet bowl that is

very badly stained. What will remove the stains?—H. H.

Probably muriatic acid applied by means of a rag and stick is about the only thing that will do the trick. If this fails we believe the best thing to do would be to set a new bowl.—Editor.



SIZE OF TAPPING.

Editor, Sanitary Engineer.—What size is customary in the tapping of a 30-foot steam radiator?—1.400.

It should come tapped, or bushed, to one and one-quarter inches.



THE LEGAL ASPECTS.

The Standing Committee of the Senate on Public Health, in their third report, dated February 18, 1910, state, in regard to the pollution of waterways by sewage and wastes, that:—

CESSPOOL VS. SEPTIC TANK.

Mr. Editor,
Sanitary Engineer, Plumber and Steamfitter.
Sir:—

Kindly illustrate in your next issue a cess-pool, which you would advise us to use in connection with the plumbing of a country residence, also stating the distance it should be from the house, whether it should be vented, and whether there should be a trap between the house and the cess-pool.—H.F.K.

"After hearing and carefully considering the evidence, your committee cannot fail to see that public health of Canada is being considerably imperilled by the present custom of disposing of sewage, garbage, etc., into the lakes, rivers and streams of the country.

"Your committee is of the opinion that the only remedy, and the only safeguard, lies in the passage of legislation to control it. The legislation to be effective must be uniform throughout the whole Dominion, and can only be brought about by co-operation between the Dominion and Provincial Governments.

"It is, therefore, recommended that the Commission of Conservation, representing, as it does, all the Governments in Canada, be requested to call together the health authorities of each province to meet them in conference at any early date, and endeavor to devise means whereby this end may be attained."

In accordance with this, the public health committee of the commission on

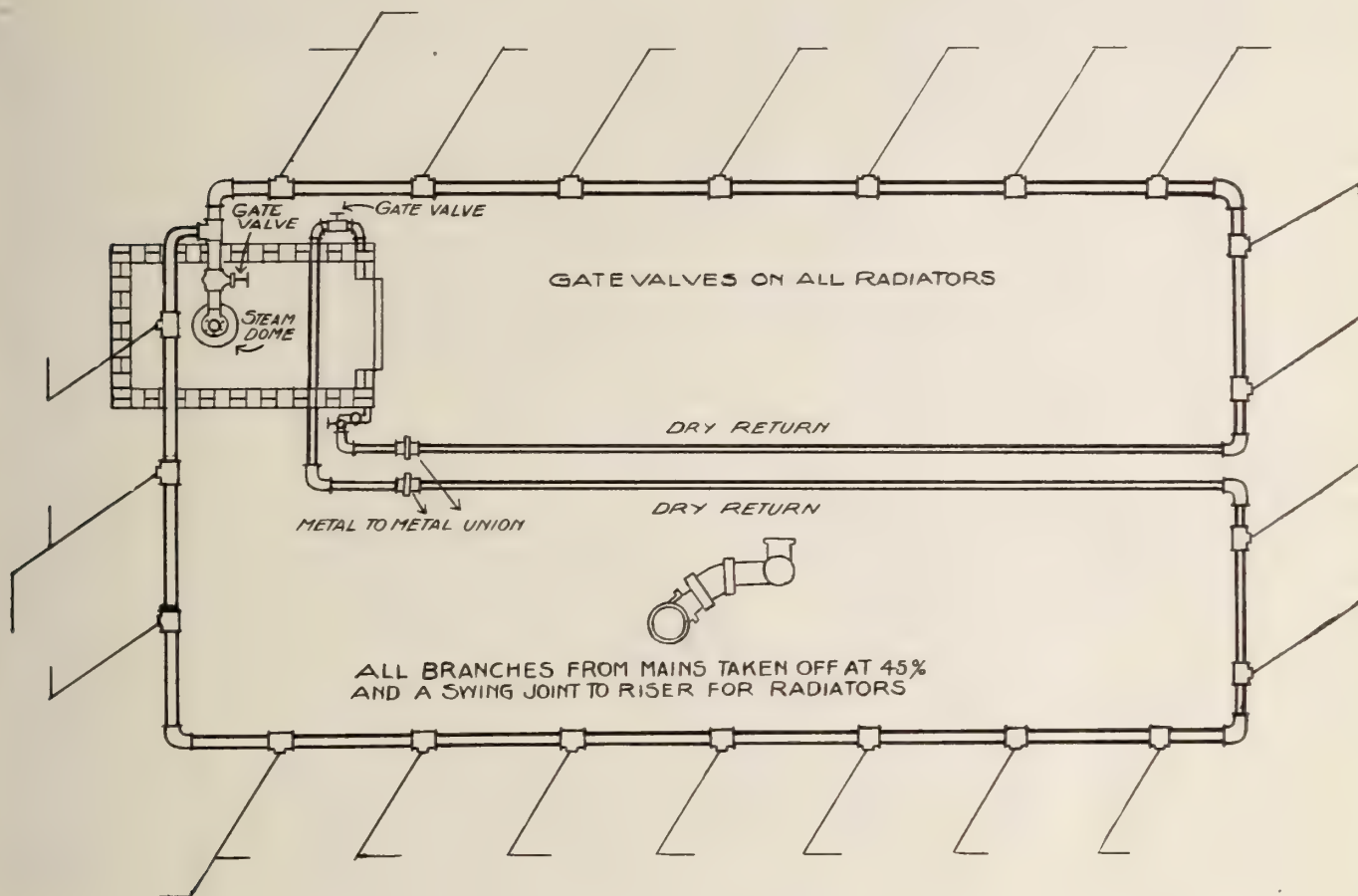
October 12 and 13, 1910, called a conference at Ottawa at which were represented the public health officials of the various provinces. Dominion officials connected with public health administration, and the public health committee of the Commission of Conservation. After an exhaustive discussion, the report of the committee on the pollution of waterways was adopted by the conference and recommendations were made that the Government of the Dominion of Canada enact a law prohibiting and penalizing the deposition of rain sewage, garbage and factory wastes in the waterways of Canada and in the waters tributary thereto. As a result of these recommendations legislation was introduced in the last session of Parliament, but owing to the sudden termination of the session, was not passed. The Bill, "An Act respecting the Pollution of Navigable waters," has been reintroduced this session, and may become law at an early date.

Section 2 of this Act makes the following provisions: Every person is guilty of offence against this Act and liable on summary conviction to penalties herein-after provided, who puts, or causes, or permits to be put, or to fall, flow, or to be carried into any navigable water or into any other water any part of which is navigable or flows into any navigable water; (a) any solid or liquid sewage matter; or (b) any other solid matter which, not being sewage, is poisonous, noxious, putrid, decomposing, refuse or waste; or (c) any liquid matter which, not being sewage, is poisonous, noxious, putrid, decomposing, refuse or waste; unless such matter, whether solid or liquid, is disposed of in accordance with regulations or orders made on permits granted under the authority of this Act.

The penalties for every corporation convicted of an offence against this Act would be a fine not exceeding five hundred dollars, and an additional amount of fifty dollars, for each day the offence continues, and for every person, other than a corporation who is convicted, a fine not exceeding fifty dollars, and an additional amount of ten dollars for each day the offence continues, or to imprisonment not exceeding two months, or to both such fine and imprisonment. These drastic restrictions, however, are somewhat modified by a clause to the effect that the Governor in Council, when it is shown to his satisfaction that the public interest will not be injuriously affected thereby, and with due regard to the interests involved and to the circumstances, means and requirements of the locality or district, may from time to time, declare any such waters, or part, or parts thereof exempted from the operation of this Act, and on such conditions and terms as he may prescribe.

One-Pipe System Steam Heating

Job For Foundry and Machine Shop Building—The Foundry is on the Upper Floor, With Basement, Which is Used For Stamping Press Work, Electroplating and Polishing Rooms—The Mains Were Put in Larger Than Necessary so as to Heat the Basement.



The above is a simple plan of a one-pipe steam system with two dry returns. It has a radiating capacity of about 2 000 square feet, including mains. Its highest point is at the boiler, and has a fall from the boiler of one inch in ten feet. None but eccentric tees are used, which were specially tapped so as to be at 45 degrees. With the horizontal branches necessary for each riser or radiator the two dry returns have a fall to the boiler of one inch in ten feet, and then drop vertically. A swing check valve is placed on each return, and a blow off at each return is put in between the boiler and check valve. These were necessary because of the water being very dirty, and by placing them between the check valve and boiler both the returns and boiler can be drained if required. It will be seen that this system is just an ordinary one, except its having two returns, and the reason for this is that one loop of main steam feed has much more radiation on

than the other. Further it was found that when one return was used an obstruction was formed by a greater amount of condensation taking place on the larger loop, and it has been proved on quite a number of installations that when a one-pipe system had more than one loop or main it was found advisable to give each loop a separate return. These, of course, could be taken care of by placing them into a header or coupling them up on the vertical piece, as they dropped down to the bottom of the boiler. The valves used on all mains, returns and radiations were all gate valves, thus preventing any water lying in the bottom of the radiators; and it is always good practice to use gate valves on steam and even hot water jobs, too, wherever they can be used. There is no doubt that less globe valves should be used. There is many a good one-pipe system that has been given a bad name for no other reason than

there were globe valves in every place where a valve of some kind was necessary. Therefore, if our fitters would just call to mind the proper valve to use in the right place a great deal of trouble would be abolished. Another point, too, regarding the kind of unions and washers, etc., used. When one counts the cost of putting a union in a job it will be found that a metal to metal union is always preferable. Then, again, on this job, no red lead paint was used; just a mixture of boiled oil and graphite, and not too much of that. Each branch or riser was taken off at 45 per cent. with the horizontal mains, and any branch which was more than two feet long was given the same pitch, viz., one inch in ten feet of a raise from the main, and every riser had a swing joint to its respective radiator. This job gives the very best satisfaction at a pressure of 2 lbs., and is fitted with a good-sized damper regulator, which hap-

pens to be one of the old styles, and is connected up with $\frac{3}{4}$ in. pipe and trapped sufficient so as to prevent the steam getting to the diaphragm washer. There is another instance where so many fit-

ters make a mistake by connecting the damper regulator direct to the boiler about the water line, or even do not have enough water in between the diaphragm washer and the live steam.

In a future issue we will reproduce one or two simple piping plans for small houses, some of which have cut the coal bill nearly in half as against some hot air jobs.

Examination for Sanitary Engineers

By E. P. Fletcher, of Calgary.

Read at First Convention of Sanitary Engineers, held in Winnipeg, April, 1913.

In the consideration of this question, I would first draw your attention to some of the objections advanced to examination of Master and Journeymen Plumbers.

In the case of a Master Plumber, (1) that the public does not look to the master plumber for protection, but to the laws governing the installation, and the Inspectors supervising the work.

(2) That the plans and specifications enable any one to carry out the work. All that is necessary is for the Master Plumber to be a business man, and that unless he meets the requirements of the laws governing the work, he will not survive.

(3) If the plans are properly prepared they will receive the approval of the Plumbing Dept. and all that is necessary for the Master or Journeyman Plumber to do is to follow directions, and if he does not do so, he will have to keep tearing it out until the Architect or Inspector is satisfied.

(4) That the only real purpose of the examination is to keep down the number of men engaged both as master and journeymen.

(5) That a biased partisan or arbitrary board of examiners could monopolize the right labor, destroy competition, extort unreasonable wages and exact inflated prices from the public.

From the journeymen we hear the old story that they can do the work all right but are not posted on theory.

These seem to be strong arguments but have failed to convince some that it is not essential that the man, who is given a set of the so-called properly prepared plans and specifications should be other than one who is told to tear out what he has done and do it in another way, by some one, placed in authority, whose position may have been secured by relationship or political influence.

The plans and specifications drawn by architects are useless, as a rule, except in the matter of placing of fixtures, and oft times very poor judgment is used in that.

A man therefore, to be a master plumber, must, by his knowledge of the business, be able to take off the quantities of material, time, etc., which could not be done by an ordinary business man.

There is a large percentage of the work for which no plans or specification is furnished and it is only by experience on similar work, that an estimate of cost could be given, so again Mr. Business man would fail.

In the case of journeymen plumber unless they know what they are expected to do before starting their work will be botched and all the tearing out and replacing by that class of men, will never make a satisfactory installation no matter how many laws are passed to govern same. Then there are a great many towns which have no inspector to tell them what to tear out. I think it a very narrow minded person who thinks that the only purpose is to keep down the number of men in the Trade. It would seem as logical that the University examinations were for the purpose of limiting the number of people who could obtain an education beyond three Rs.

In my opinion the low standing which the plumbing trade has in the eyes of the public, is due to the large number of men in the trade whose one accomplishment is the wiping of a joint or beating lead and could not tell you how a vent pipe prevented syphonage, although they might tell you what was its purpose.

The greatest reason in my opinion for advocating the examination for both master and journeymen plumbers is the setting of a standard which compels them even against their own inclination, to study and find out why certain work which they do is essential and why other things they might do are dangerous.

Take an incompetent master or journeyman in small alteration or repair work, much of which is sure to get by inspectors, unless he knows enough not to do certain things a large amount of

bad work is done. In my experience as a member of the Calgary Board of Examiners, I cannot but express my surprise at the ignorance of the practical points in plumbing by men who have charge of some of the largest installations in Canada. By practical points I do not necessarily mean the actual work but the knowledge of what enters into a practical installation of plumbing work.

A plumber should not only have the necessary skill to execute a certain piece of work, but should understand the natural laws which are either an assistance or a detriment to the system and the fixtures attached.

Every person owes something to the calling by which he earns his living, and unless a person is willing to try and inform himself sufficiently to understand the reason for doing work in a certain manner, whether he accepts any particular method or not, in my opinion he should not work at a trade affecting the health of the community until such time as he acquire this knowledge.

There may be biased or arbitrary Board of Examiners formed and we know that there have been such, but there should be ample means to unseat any person appointed whose actions or judgment is biased or in any way partisan.



AMOUNT OF PRESSURE FOR STEAM JOB.

Editor, Sanitary Engineer,—On a steam job of about 500 square feet of radiation how much steam pressure should be necessary to heat all of the radiators?—Owner.

It depends on how the job is laid out and pipe sizes. If the work was performed by a man of experience we should say that from one to two pounds of steam would do the work. We know heating contractors who put in jobs of this size in gravity work who make the job perform on about half a pound's pressure.



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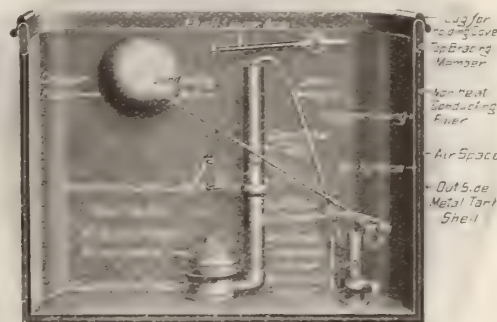
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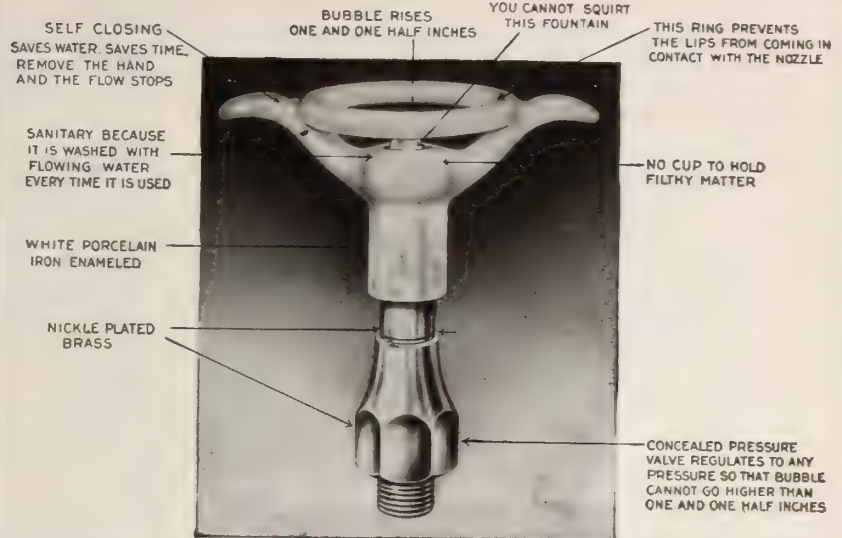
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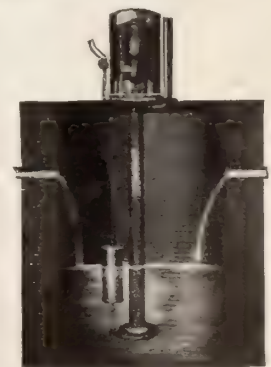


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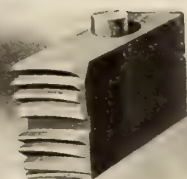
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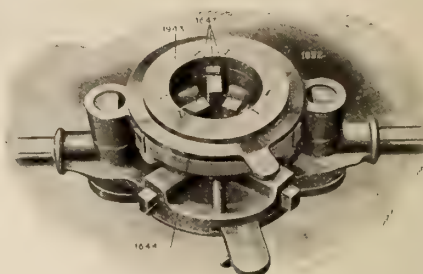


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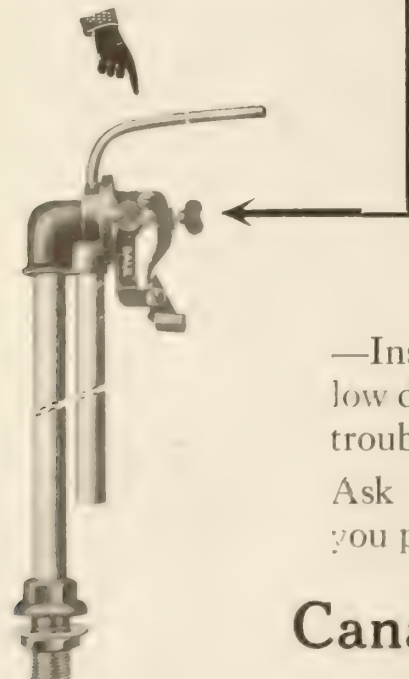
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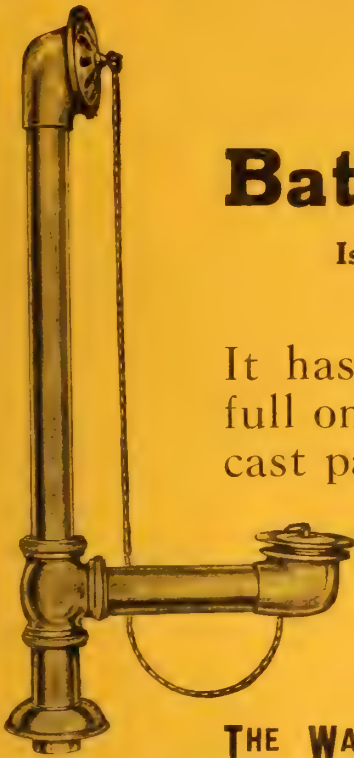
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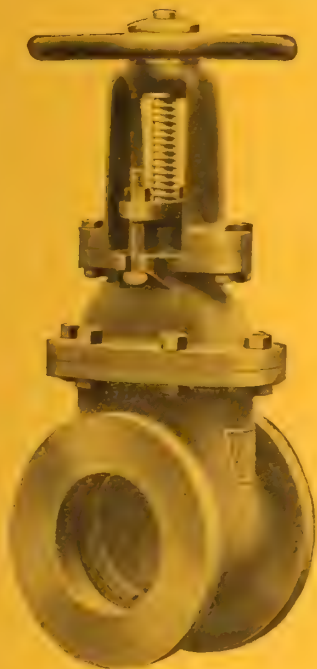
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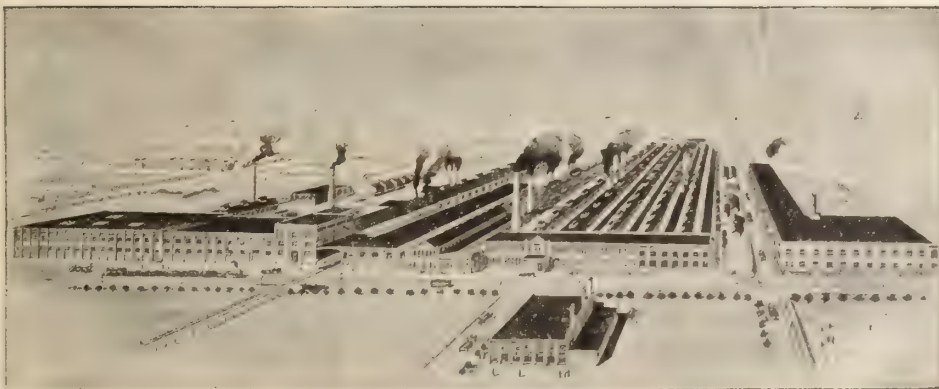
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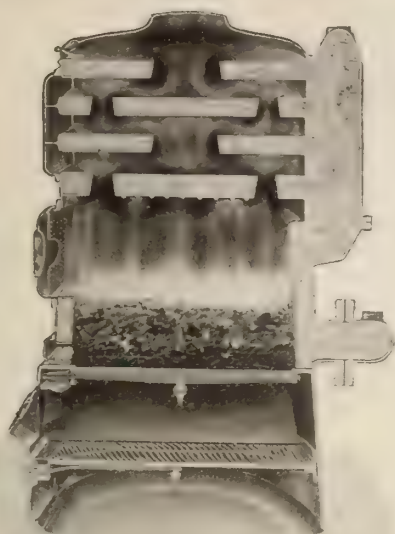
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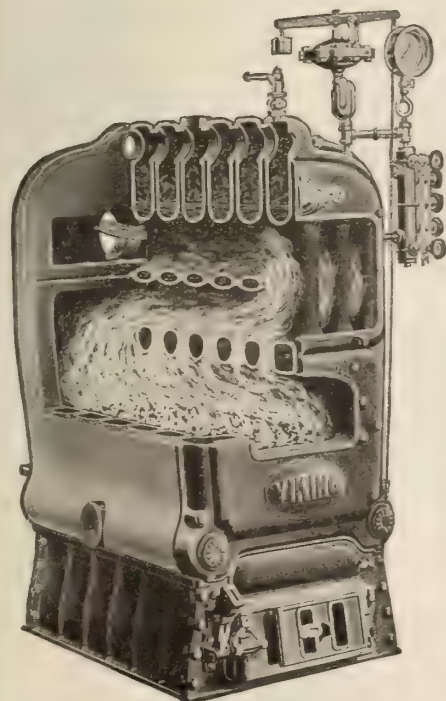


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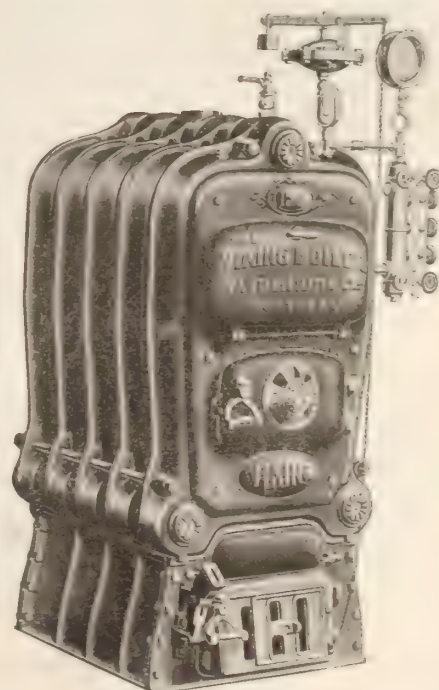


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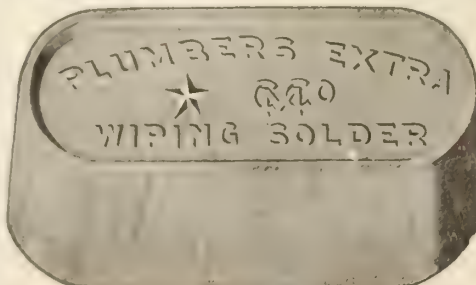


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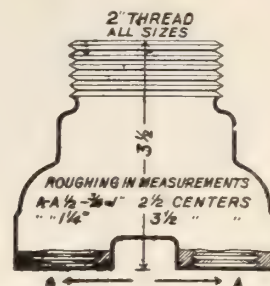
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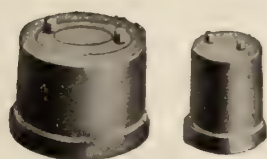
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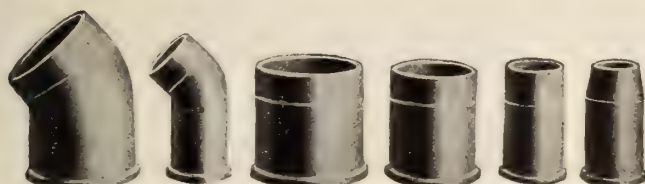
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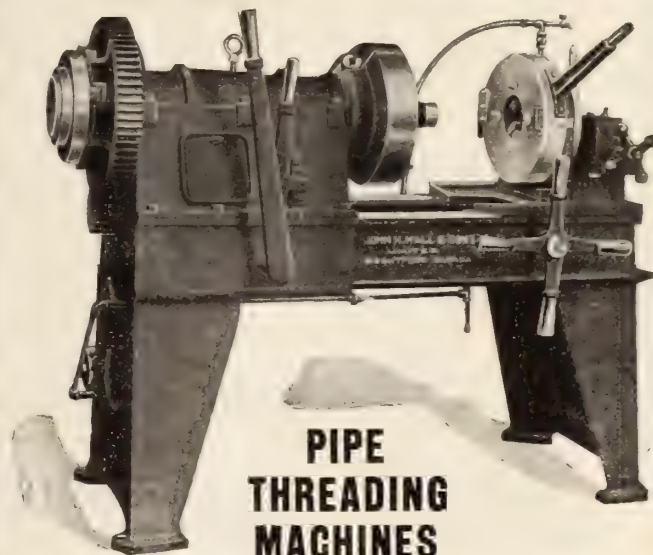
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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VII.

TORONTO, JULY 15, 1913

No. 14

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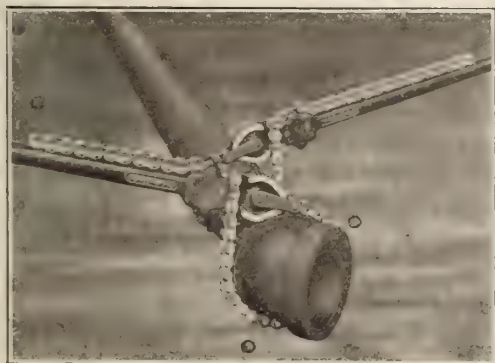
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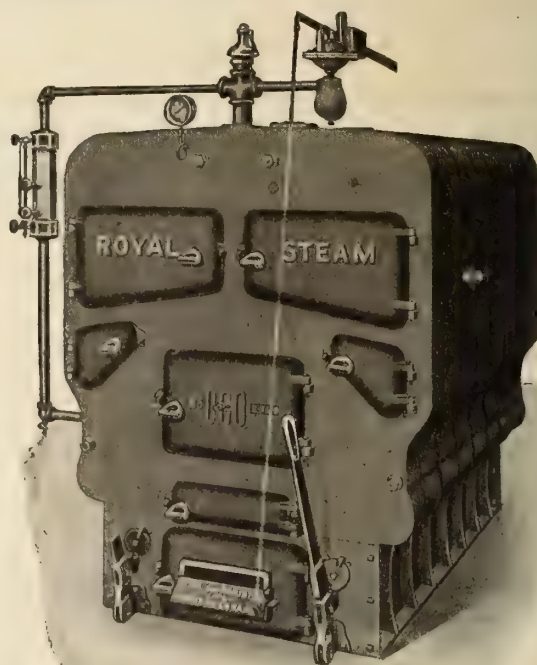
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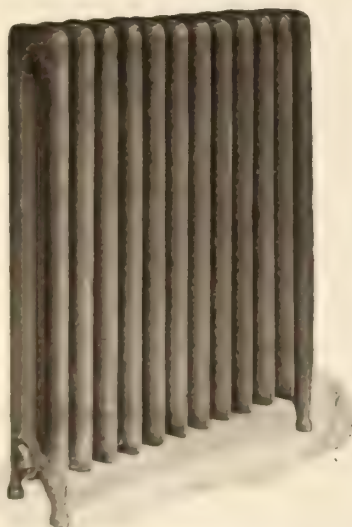
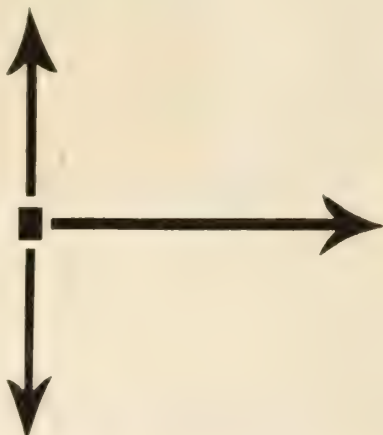
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TORONTO

Fourth New Brunswick Convention

Opens With Large Representative Gathering. Many Supply Men Present. The Whole Convention Proved Very Interesting and Uplifting, Ending With Dinner at the Queen's Hotel, Fredricton.



GEO. BLAKE.

Fredericton, N. B., July 10.—The fourth convention of the New Brunswick Society of Sanitary, Domestic and Heating Engineers was held here this week and proved one of the most successful in the history of the organization.

There was a representative gathering of delegates from the various centres and to all the convention proved most interesting as well as enjoyable. The sessions were held in the Church Hall Building on Carleton Street, while the delegates made their headquarters at the Queen's Hotel and Barker House, the banquet, which marked the close of the convention, being held at the former.

When the convention opened on Tuesday Mayor W. S. Hooper and Ald. W. E. Farrell welcomed the delegates on behalf of the city of Fredericton, and Mr. D. J. Shea spoke on behalf of the Fredericton branch of the society, expressing the hope that the convention would be a successful one and that the visitors would all enjoy their stay in the city.

Mr. George Blake, of St. John, president of the society, who acted as chairman of the meetings, thanked the city's representatives and the local society for the hearty welcome extended the visiting delegates, at the same time expressing the view that this convention would be one of the most important

and successful in the history of the society. "This is one of the prettiest little cities on earth and we are all glad to be in Fredericton," declared Mr. Blake.

The following committees were elected:

Audit committee—L. H. Estano, F. W. Noble and E. L. Brooks.

Credential committee—D. J. Shea and G. S. Dorman.

Select committee—A. H. Farrell and E. L. Brooks.

Resolution committee—W. J. Crawford and F. W. Noble.

Officers Are Elected.

At Tuesday afternoon's session the officers were elected as follows:

President—George Blake, St. John.

Vice-president—D. J. Shea, Fredericton.

Secretary—W. J. Crawford, St. John.

Sergeant-at-arms—F. S. Walker, St. John.

Ordinarily the officers are elected at the final session of the convention, but a change had to be made this year owing to President Blake being called home on business in connection with the St. John Fire Department of which he is chief.

On Wednesday St. John was selected as the next place of meeting and the following committees were appointed:

Sanitary committee—F. S. Walker, D. J. Shea, F. W. Noble.

Heating—Edward Harley, W. J. Crawford, Wm. Watson.

Arbitration—E. L. Brooks, G. S. Dorman, J. W. McCarthy.

Legislation—A. H. Farrell, F. W. Noble, George Wandless.

Apprentice—Wm. Watson, E. L. Brooks, L. H. Estano.

Education—G. S. Dorman, F. W. Noble, D. J. Shea.

Examination—J. W. McCarthy, D. J. Shea, L. H. Estano.

At the closing executive session in the afternoon, Mr. D. J. Shea, the vice-president, made suggestions that reports of committees to be presented at conventions should be sent out to the local branches about two weeks in advance so that the members might become thoroughly conversant with the subjects to be discussed.

Following the executive session the association met the representatives of the supply companies when matters of mutual interest were discussed. Later the delegates were entertained at an automobile drive, including a run up to Springhill, and the supply companies'



PETER CAMPBELL.

representatives were afterwards entertained at a 20-mile an hour motor boat ride by Mr. W. T. Chestnut, of R. Chestnut & Sons.

In the evening the banquet took place at the Queen's Hotel and was in every way a great success and highly creditable to the local branch of the society who were the hosts of the evening and also to the hotel. A full course dinner was served in an excellent manner and the evening very pleasantly spent, the speeches being of a high order, while there was sufficient good wit and humor to keep everybody in the best of spirits at all times.

A male quartette composed of Messrs. George and Lorne Wandless, Fraser Hazlett and D. H. Staples rendered a number of selections and there was an appropriate presentation during the evening to Mr. F. W. Noble, of St. John, one of the "front row" delegates. The Standard Ideal Company, of Port Hope, Ont., through Mr. J. J. LaFerme, of Montreal, their eastern representative, furnished the souvenirs of the occasion in the shape of model enamelled bathtubs of the most modern design. They were put into actual, if unusual operation before the evening was finished.

The guests of the society, including Messrs. John Keefe, Ramsay, Terry, McKay, LaFerme, McLaughlin and Cummins of the Supply Men's Associa-

tion, Publicity Commissioner Geo. M. McDade, Mr. W. A. Walsh, the society's official photographer.

Mr. D. J. Shea acted as toastmaster very acceptably and the toast list follows:

The King.

The city of Fredericton—Responded to by Mayor Hooper.

The Supply Men's Association—Responded to by Messrs. John Keefe, of St. John, and J. J. LaFerme, of Montreal.

Sanitary and Heating Engineers—Responded to by Messrs. George S. Dorman, of Moncton, and F. W. Noble.

The uplifting of the profession and the proper recognition of its members as the custodians of the public health.

The Ladies—Mr. C. H. Ramsey, St. John.

The toast to the Fredericton Master Plumbers' Association, the hosts of the evening, was proposed by Mr. Dorman and spoken to by Messrs. Campbell, Brooks and McLauchlan, all expressing their appreciation of their entertainment while here. Toastmaster Shea replied, expressing the pleasure of the local association at being able to entertain the society and expressing the hope that they would return here in 1915.

The gathering dispersed at midnight, after singing the National Anthem.

The delegates included the following:

St. John—Geo. Blake, F. S. Walker, Fred W. Noble, Peter Campbell, Edward Harrington, W. B. McDonough, J. S. Coughlin, R. T. Fitzgerald, William Emmerson, W. J. Crawford and H. Codner.

Moncton—Geo. S. Dorman, William Hudson, L. H. Estano, Eli Brooks, J. W. McCarthy and W. B. Parker.

St. Stephen—Earl Steeves and Daniel Regan.

Woodstock — James Fellows and James P. Pickles.

Campbellton—Hugh Marcus, Mr. English, Mr. Wallace and Mr. Christie.

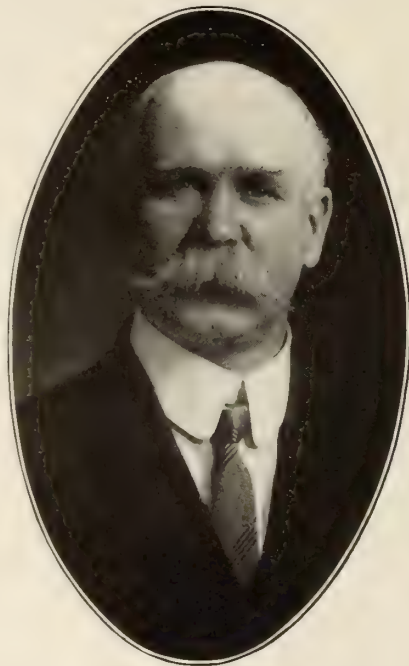
Halifax—J. Goodman.

Charlottetown—Bert Shaw.

London, Ont.—Mr. Israel.

Fredericton—A. H. Farrell, D. J. Shea, Richard O'Brien, Edward Hurley, W. Sentner and George Wand-

earnestness and tact that the sanitary engineering business was one which he felt should be looked upon with high regard. In conversation with him his whole soul seemed to be wrapped up in the betterment of the trade. Any laws or tests which would raise the standard of efficiency and durability comparable with reasonable cost were endorsed by Mr. Dorman. His conversations, his arguments for or against this or the other motion showed, too, that he came to Montreal with some object in view, and many a time during the meetings at the convention he spoke out for right with a clear view of fairness for all. Mr. Dorman was appointed provincial vice-president for New Brunswick. Sanitary Engineer wishes him all success, and will look forward to seeing great results under his vice-presidency. A great deal more will be accomplished



G. S. DORMAN.

by all his fellow members rallying round him with a greatness of heart and with a view to making the New Brunswick Association a power for good in the Sanitary Engineering field.

NEWLY APPOINTED TO THE
OFFICE OF VICE-PRESIDENT
OF NATIONAL ASSOCIATION FOR NEW
BRUNSWICK.

G. S. Dorman, whose photo we have great pleasure in reproducing, was one of the "live wires" at the recent convention in Montreal. He showed by his

READERS

The Editor wishes every one interested in

Domestic Sanitary Heating and Ventilating Engineering

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

ERROR IN DRAWING.

Thanks to Charles F. Greeve of Orangeville for pointing out error in drawing on two range-boiler and furnace plan of piping in the last issue. It was merely a drafting error and we may state that the cold water main is connected on the wrong line of pipe. It should have been carried to the pipe line above.—Editor.

Mrs. and Mr. J. E. Farrell of North Bay have returned home from a trip down South. They had a very enjoyable trip and visited many places of interest, historical and otherwise.

READ
YOUR
TRADE
PAPER

Advocates Cast-Iron House Drains Only

Largest Cities on This Continent, Canada and U. S. A., Endorse and Enforce the Use of Cast Iron Pipe for House Drains and in Several Cities in Western Canada the Law Calls for Extra Heavy. Very Few Allow the Use of Tile Drains. Excreta from Persons Should Not be Allowed to Enter Sewers.

We as sanitary engineers know what sewers are built or laid for. We also know that sewers and drains are really the intestines of our cities and towns. In that case, they should be kept clean. We would never expect to exist very long on this earth if our own intestines were in a bad state and any defects soon bring very acute pain with quick and certain death in a very short time. We have to thank nature, which has provided pain. Pain is the best friend that humanity has. Although no one likes it pain is our greatest prompter. Pain warns us at once of trouble and tells us something is wrong. If it were not for pain in the different parts of our body our existence on earth would be short. Now it is too bad we cannot apply the same laws to our sanitary engineering, but because the pain through our neglect of sanitation does not come to us personally, we allow things to go on in our cities and towns and never seem to care what happens. Just fancy what we have to thank nature for, nature has told us that typhoid can be prevented by keeping our intestines clean and that means our drains, sewers, streets, water supplies, etc. We must consume the germ of typhoid before we are attacked with typhoid fever.

Now what are we doing along these lines? The general public have the idea that all filth that can possibly be put down a drain should go there, whatever the state or nature of that filth may be. When a city or town installs a sewerage system it should be the most practical in general construction. There should be laws put into force to keep this system as clean as possible and no diseased matter should be allowed into it. When a person is afflicted with typhoid in most cities and towns, no provision is made to dispose finally of the excreta from such patients. It is left with the persons in the house or the nurses to use some kind of disinfectant. Now disinfectants used in that way are a very uncertain quantity and cannot be relied upon when such a vital subject is involved and one of the greatest problems of the age to-day is the pollution of our water supplies. If our sewers and drains had not been poisoned by

typhoid epidemics and those towns and cities who empty their drainage systems into the lakes, rivers and streams to-day and who pollute one another's water supplies should, to say the least, attend to the matter as to the state of the sewage before it is emptied into the drains. It would be also well to keep this sewerage system up-to-date by installing automatic flush tanks on several sections so as to be sure of regular and spontaneous flushing. Further the excreta from a person afflicted with any infectious disease should not be allowed to enter these drains as we must not lose sight of the fact that they are the vital intestines of our cities. This excreta should be collected by the health departments in tightly sealed receptacles and taken to the incinerator or a place fitted up to receive them, these receptacles to be made so as to stand any heat which would be necessary to burn up the excreta.

Then again our house drains should be of up-to-date material and constructed in thorough manner. They should be put to the most severe test. The old tile drain is a thing of the past in all up-to-date cities. For one to mention that tile pipe is permitted within the walls of a residence, factory or workshop is to practically admit a very low standard of sanitary engineering, and one who is conversant with these facts can prove that tile drains have and are a source of trouble and worry. Just imagine a family being taken sick in a house where the sanitary engineering is not up-to-date. What would be the verdict as to the cause of the sickness? If the disposal of sewage had been kept before the people by our health departments, we should not now be afflicted with periodical typhoid epidemics or filthy sewage disposal systems, polluting the air and this state of affairs is almost world wide. The different nations are spending money on military and naval affairs and not a cent on the most vital question of sanitation. Just think for a moment what the asset is to the country of one life which is lost by a preventable disease. Just think what ten million a year would do if spent on sanitation, and Canada alone is spending ten million dollars per annum on military and naval affairs. Sanitation

would be in a far greater state of advancement than any one could conceive if such a sum was at the commands of sanitary engineers. It is simply out of sight, out of mind when our sewage is hidden we forget it until we are taken sick. Hence we come back to the assertion made at the beginning of this article, that pain and death we may add as our best friends. Let us see to it that the authority we have vested in our health departments is not only on paper, but is actually effectual. We not only need good drainage systems, but we need to know how to use them. Keep them in good order and not abuse them.

LONDON MAN DROWNED.

London, Ont., July 1.—George Skelly, aged 32, a plumber, whose home was at the corner of Tecumseh Avenue and Cathcart Streets, was drowned in a pond known as the Second Cove of the Thames River this morning, he having been stricken with cramps while bathing. Skelly, who was unmarried, left home early in the morning with two friends, neither of whom could swim well. They entered the water at a point several hundred yards south of the Pipe Line Road, and out of reach of assistance. Skelly sank when stricken with cramps, and as the water was rather deep and filled with treacherous weeds, neither of his companions could do anything. The body was recovered after a search of four hours.

H. W. JOHNS-MANVILLE COMPANY OPENS NEW BRANCH.

In accordance with its long established policy of business expansion, this concern has recently opened a branch office at Charlotte, N.C. The new office which is located in the Commercial Bank Building, is in charge of Mr. E. U. Heslop, who is assisted in covering the western section of North Carolina by Mr. P. J. McCusker and Mr. Paul W. Whitlock.

S. T. Dickson, sanitary and heating engineers of Kamloops, B. C., have established a new branch at Salmon, British Columbia.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CARE ADDRESS
Macpubco, Toronto, Canada, London, Eng.

John Bayne MacLean, - President

J. G. Lorrimer, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, JULY 15, 1913

Don't Waste Time

Don't waste time in any shape or form. How much time is wasted in this business of sanitary engineering?

One of our readers when asked what time he lost doing his experience stated that about 70 per cent. of his time was wasted in attending to calls to look at work or troubles of the general public and estimating on proposed work. This time he said was on work he never got. There is not the slightest doubt this matter is a very serious one to those engaged in the sanitary and heating trades. How can this trouble be overcome? How can this evil of time wasted be solved? Why is so much time wasted?

The public call a man up to ask him his advice on a certain piece of work, to get a tender on it, etc., or ask for his foreman to be sent to see some plans or even to advise how this bathroom be placed and a hundred and one other things regarding either sanitary or heating. How often is the work done by the one party who was consulted? Not very long ago, no less than 7 firms were asked to tender on a certain job which needed the head of the company or the owner himself to see the job and the total value of this work only amounted to \$16.00, including material. At least 14 hours time was wasted of some one's, all for advice as it were.

Now, it is about time this imposition was put a stop to. In the first place if all in the craft were first class men, their prices would not vary very much. One of the reasons so many prices are asked for by the public is because we have a lot of men in the trade who are not doing the right thing by themselves and spoiling the trade for others. Lots of work is done right here in our own locality, yes, and in all parts of Canada, at a price far below what it should be whilst other jobs are outrageously high. While every man who pays his license fee without having to qualify is allowed in the business so long will this time be wasted. The public have the trade at their beck and call any time during day or night and if no actual work is done whatever whatever amount of advice has been given, no charge is made and none expected. Of course, this may be alright to a company or man who employs 20 or 30 men and has a large regular amount of business, but how about the employer who only has about 5 or 6 employees? It would be very interesting reading to find out the time wasted in such fruitless calls and also to find out how many hours were lost in this way by each and every employer during the period of one year. It would also be interesting reading to know how many hours of the sanitary and heating engineers' time is

frittered away by the public for pure curiosity. There is not one of our readers but what can point out lots of cases where their advice had been asked about some proposed or supposed to be proposed piece of work and, where the advice has been given, the price has involved too much money and nothing has been done on it for several years. Now, what would happen if the public wasted the time of the lawyers or doctors like that? If anyone consults a lawyer it is generally a fee of \$5.00 and a doctor's fee is \$2.00. Why should the sanitary or heating engineer not charge for his time. He is just a professional in his class and even more so, because if he is a good mechanic and gives advice upon any troubles he must guarantee a cure. He has to know the LAW of gravitation, sanitation, heating and ventilation. He can cure any troubles which may occur to the INTESTINES of the homes. But neither of these aforementioned professional gentlemen can guarantee a favorable verdict in a legal transaction or a cure to any intestinal troubles, yet they are paid for their advice. Why should there not be a charge made in the case of a call or for advice given by a member of the sanitary and heating craft? The fact of the matter is that there are too many cheap jacks in the trade, who are ready to run after business. It would be rather hard on the public for a while if sanitary and heating engineers did decide to make a charge but before very long, they would realize the necessity of making as few calls as possible and those would only be to men of good reputation in the trade. It would mean a weeding out of the incompetent. It would awaken the public spirit to the necessity of demanding that only qualified men be granted a license to practice just as in the case of medical and legal professional men. These men have to pass certain examinations before they are allowed to practice and their occupation is certainly only secondary where our sanitation problems are to be considered. By all those who go into the sanitary and heating business having had a sound, thorough training and finally having to pass an examination, the public would be better served, get better value for their money and also become more educated to the fact that cheap jacks in the sanitary and heating trade are a public, yea, we should rather say, a universal, menace. Further, it is a question whether the public are aware that in almost any city in Canada anyone can get a plumber's license for the nominal fee of from \$1.00 to \$5.00, no matter what their qualifications are. Just imagine the very men who, in a way, have the lives of the people in their care, can be permitted to install such work in our homes which, if not the very best, may be the cause of untold sickness and death.

Don't waste time. Time is money and the public waste time, money and run the risk of losing their lives when they give their work to the man who gives the lowest figure irrespective of the qualifications of the man as a mechanic. So first let us strive for properly qualified men being asked to pass a certain examination both of mechanical abilities and character. Then strive to make a charge for time lost or advice just as our legal and medical friends do and the public will see they get the best advice, and less time will be wasted and better work will be the results.

EDITORIAL COMMENTS.

A gentleman is one whose virtues are not founded on self interest.—Hubbard.

No change of circumstances can repair a defect of character.—Ralph Waldo Emerson.

When Jefferson said: "Those who labor in the earth are the chosen people of God," he did not mean all men should become farmers. Some could be Sanitary Engineers without risking their Eternity.

Vacuum Cleaners a Good Line for Sanitary Engineers

This is a Sanitary Line Which Could be Developed by Sanitary Engineers—Several Manufacturers of These Lines forced to Install Their Own Piping Because of the Apathy Shown Towards the Trade—These Manufacturers Are Not Anxious to Install Pipe Lines if Sanitary Engineers Will Study the Matter Up and Become More Interested.

Here is a line which by rights should be one of the sanitary engineers chief source of revenue, a line which is being gradually but firmly put forth. Most all the leading residences and apartment houses are being equipped and have already their own vacuum system installed. The writer has spent considerable time recently interviewing several manufacturers of these equipments and it is surprising to see so many successfully working. One can but feel that another very important field of sanitary engineering is being developed and here is another point. This field is not being developed by the sanitary engineer, but rather by another class of sanitarians. "The Vacuum Cleaner Manufacturers." Now these manufacturers in several instances stated that they were not wanting the work of installing the pipe lines themselves but were left without any choice in the matter. One manufacturer stated that so far nine out of every ten installations of vacuum pipe lines put in by sanitary engineers had to be torn out or in some cases left in the walls of the house and another set of pipes put in. This statement, too, has a great deal of truth in it and is greatly to be regretted because if such a state of affairs is allowed to become universal, it means a new field as a source of further revenue will be closed to the sanitary engineer and another field of operation for another kind of sanitary engineer will have been created. Whereas a little careful study on the part of the present members of our craft would widen the field of operation.

The trouble in the first place is that the ordinary pipe will not answer the purpose so we are given to understand. Then, next is that our men are not instructed to ream all piping. Third, the right kind of fittings are not being used by our craft when called upon to put in a vacuum pipe line. The first objection

can easily be overcome as there is pipe to be got, made for other purposes such as electric conduit. This pipe is electro galvanized outside and japanned or enamelled inside and is not much more expensive than regular galvanized pipe. The second trouble is a very serious one as if this is not done where steam, hot water, vent pipes or cold water pipes are installed it is a very grave mistake. Allow us to depart a while from the vacuum topic and refer a little to pipe reaming. To prove the absolute necessity for reaming all pipes just measure your pipe after it has been cut with a wheel cutter and see what percentage the carrying capacity of the pipe has been reduced, and see how much more successful and satisfactorily a job of heating or a water supply would work and how great the results would be over a job where the pipes are not reamed. There are several pipe cutters now on the market which leave no burr in the interior of the pipe and which even cut the pipe quicker. Now, regarding the non-reaming of pipe on a vacuum line, this is no more serious than it is on a heating or water supply job, only on a vacuum job the trouble is sooner brought to a climax and remedied but a heating or water pipe job drags on and on and is a constant source of trouble and never ending cause for reduced capacity of the installations.

The third trouble is a matter easily remedied by our sanitary engineers themselves, because they mostly do have the right fittings in stock, viz: the ordinary galvanized drainage fittings similar to those used on a Durham system, viz: long sweep fittings which are recessed.

Then, last but not least, if those now in the trade would devote a little more time to studying new problems which they are daily confronted with, it would be surprising how much more would be accomplished and how easy they are to

overcome. The vacuum systems of heating are here to stay and before many years we shall have other vacuum systems in operation along lines least expected by those in the trade. Never was there such a period where such great strides were and now being taken along lines of sanitary engineering as at the present day. So it behooves us who are employed in the craft to wake up and listen to the call for more live, up-to-date sanitary engineers. Then the days of the brooms, the sweeping brushes and dust laden homes will be a thing of the past and none too soon.

In a future issue we will take up the approximate cost of installations of pipe lines for vacuum cleaning machines along with plans now in successful operation.—Editor.

TRADE NOTES.

The Association of Sanitary Inspectors of Western Canada, recently, sent a letter to Lord Strathcona asking that he allow his name to be used as vice-patron of the organization. The Duke of Connaught has expressed his willingness to become patron.

There are to be some important changes made in the by-laws recently drafted by the City Council of McLeod, Alberta. When these changes are made this city will have a up-to-date set of ordinances, which will shortly go into force.

Messrs. Knetchel Co. of Saskatoon, Saskatchewan, have recently acquired the services of Percy Atkinson to act as superintendent of their sanitary engineering department. He was recently with Messrs. Thompson & Homer in the same city.



Toronto Society's Annual Picnic

Annual Picnic to Berlin Was a Banner Affair Thoroughly Enjoyed by One and All. Quite a Number of Supply Men Present From All Parts. Freedom of the City Given to Howell & Company by Berlin's Chief of Police. Extra Constable on Duty to See That The Excursionists Were Not Molested in Any Way.

Toronto Society of Domestic Sanitary and Heating Engineers held their second annual picnic on July 5 at Berlin, Ont. The committee appointed to take charge of the proceedings were Messrs. Glynn, Fullerton, Needham, Boddington, Farthing, Smythe, Rud-dick, Gentle and Hillier. The whole event proved to be very enjoyable and a beautiful day favored the excursion-ists.

All aboard shouted Harry Water-man, president of the local association, as the train steamed out of the Union Station for Berlin, but unfortunately all was not aboard. Bro. Boddington got a temporary separation from his wife and family on account of a slight mistake as to which platform the excursion was to start from. We hope Mrs. Boddington spent the time as heartily as her "worst half," though several of the ladies present expressed regret at not having the genial Mrs. Boddington with them. The day was rather dull in the early morning, but brightened up to an ideal day. In leaving Berlin the history of the departure from the Union Station repeated itself when C. Hicks left his wife and family behind in Berlin. However, during the return journey Charlie made a very jovial bachelor. We also hope his was only a temporary separation and that his better-half reached

home none the worse for her day's out-ing.

Immediately after doing full justice to the good things supplied by Caterer Eggan at the Victoria Park the base-ball games began, with the following teams as principals:

Toronto Society Team.

Menzie, first base.
Mansell, second base.
Price, third base.
Allison, right-field.
Knott, left-field.
Smythe, centre-field.
Reading, catcher.
Mc. K. Minn, shortstop.
Ed. Needham, pitcher.

Ontario Team.

Schroeder, first base.
Wheatley, second base.
Mathews, third base.
Boddington, right-field.
Herbert, left-field.
Jury, centre-field.
Goodman, catcher.
Quinn, shortstop.
Twaits, pitcher.

Only 5 innings were played owing to the extreme frost, the score at the end of the fifth inning stood at 16 to 16 in favor of the winning team. Needham, for the winning team, pitched a splen-

did game until he froze up early in the first spasm and was replaced by Price in the third gasp, but he only lasted one inning, being replaced by the first mentioned pitcher the moment he got thawed out, who then continued to the end of the chapter. T. B. Smith was kept busy in centre-field chasing flies and was caught on his knees behind a tree praying for his Ford to help him cover the ground. Menzie made a brave attempt to hold down first base, but could not get all the low ones. Owing to lack of space it is impossible to mention all the splendid features of the game, but everyone played an errorless game as far as possible, as the score would indicate. G. F. Frankland acted as official scorer and did his best although his attention was a little de-tracted from the game on account of him having heard that custard pie was part of the menu for supper. A snap-shot artist was on the scene, but the speed which Frankland made on his bee-line to that custard pie was too quick for the camera. At the time the Toronto and Ontario game was in progress another pair of teams were doing all that laid in their power to create baseball records. They were in such a hurry to get down to the games that no titles are on record of each team. However, one team comprised the sanitary engineers and the other



The four teams which created baseball records at the picnic grounds in Berlin.

supply men. Members of each team were as follows:

Sanitary Engineers.

Waterman, first base.
Aggett, second base.
Allison, third base.
Miles, shortstop.
Abbott, catcher.
C. Hicks, centre-field.
Griffith, left-field.
Warwick, right-field.
H. Hicks, pitcher.

Supply Men.

Davies, first base.
Dunn, second base.
Hadley, third base.
Crushley, centre-field.
Darling, left-field.
F. Quinn, right-field.
Kingswood, shortstop.
Rogers, catcher.
Stimson, pitcher.

Bell was scorer of this game and was not troubled with the thoughts of eustard pie.

Games were then indulged in, which were chiefly races of one kind or another, from the little tots to the up-grown single and married folks, including the travelers and supply men.

Prizes were awarded, viz.: First, second, third and complimentary. These prizes consisted of dolls, humming tops, bats, balls, baseballs and bats, skipping ropes, baseball gloves, blue bird broaches, baseball masks, combs and brushes, mirrors, fountain pens and penknives and all throughout these races Longboat was put into the shade, especially by those ladies who wore semi-hobble skirts.

PICNIC NOTES.

Brother (Ed.) Needham in a New Role.

A rather amusing incident occurred at the Toronto Sanitary Engineers' picnic held in Berlin on Saturday, July 5, which, however, only came to the notice of a few of the members. L. C. Howell, of Galt, who is secretary-treasurer of the Galt Brass Co., Limited, motored from Galt, and in leaving the garage, through some oversight, was allowed to depart with two auto numbers which did not agree. This was what caused lively action on the part of one of the police force at Berlin just at a critical time, when Mr. Howell was endeavoring to demonstrate to the Toronto Sanitary Engineers what a beautiful city Berlin

is. Their pastime was suddenly disturbed, and the whole "bunch" had to report at police headquarters in the city of Berlin.

Ed. Needham waxed eloquent, and pleaded their case in a manner well becoming any experienced solicitor, and the party was pleased to note that he was successful in having them released and again given the freedom of the city.

Needless to say, Mr. Needham's successful pleading was very much appreciated by L. C. Howell.

TRADE NOTES.

Frank Short, who was recently a partner with I. J. Ross for the past six years, has opened an establishment in Galt, Ontario, to carry on the business as sanitary heating and lighting engineers.

Messrs. Thompson & Homer of Saskatoon have lost one of their staff in the shape of W. G. Armstrong, who has formed a partnership with Geo. Lynch and will open an establishment in the sanitary and heating engineering business in Medicine Hat, Alberta.



1 Group of Toronto Sanitary Inspectors; 2 Mr. and Mrs. Hamsworth in their auto; 3 Berlin Sanitary Engineer's Wives under protection; 4 Bro. Frankland; 5 P. C. Meehan and family, Berlin.

Better Laws on Sanitation for Montreal

In Montreal Present Laws on Sanitation Only Paper Ones, Even Those Not Carried Out. Cites the Very Stringent Enforcement of Laws on Sanitation in English Towns and Cities.

In Montreal recently Dr. Laberge gave his candid opinion regarding the laws on sanitation. He urged that wider powers be given to the municipal health departments. He asked for laws to be brought into force and enforced. Laws which would be a power for good and power given to the health departments which would be more authoritative and not mere paper laws, and referring to a conversation he gave out to the "Montreal Star," which we herewith reproduce:

"As I stated in yesterday's Star," Dr. Laberge remarked this morning, "I do not think we pay sufficient attention to the heavy infant mortality. I thus suggested that we might follow the example of Paris and give assis-

tance in the way of foods, to poor mothers, so as to induce them to feed their children by natural means.

"But we should be able to do more. Our powers in regard to sanitary dwellings are now very limited. There are scores of inhabited buildings in the city which a truly progressive municipality would not tolerate. We ought to have the power—which is strongly exercised in English municipalities for instance—to condemn such buildings as unfit for habitation. There are many buildings in the poorer parts of the city which ought to be condemned, but we are almost powerless to take an effective step.

"Anyone reading the by-laws of the city might imagine that we have very

extended powers. As a matter of fact, it is common knowledge that our powers are largely on paper.

For Sanitary Housing.

"We must take up the question of sanitary housing. Until we have better housing conditions, we must expect a high rate of infant mortality.

"There is too the question of bathing. We have our public baths, but I do not think they are used as they should be. Still better would it be if we made it obligatory that every residence should contain a bath."

Dr. Laberge is only one of the many medical gentlemen who see the necessity of more cleanliness in the city homes and streets. When we think



1 Mr. and Mrs. Daniel and family; 2 Mr. Aggett and family; 3 The Daniel twins, Marjorie and Wilmot; 4 Mr. and Mrs. Hutcheson and Mrs. Preet.

that Canada has such a high rate of infant sickness and death it is time we looked into things. There is not a city in Canada but what we can find worse conditions than can be found in any city in Europe, taking into consideration the length of time these cities have been in the making. Montreal has its slums, Ottawa has its homes which are unfit for human habitation. Toronto has its share and so have London and Hamilton. Now why are these conditions existing in this new country? These conditions have gradually accumulated because we have permitted them. We have no practical men representing in a practical way the needs for better conditions. On our boards of health we have the supposed pick of medical men. But medical men, give them their due, are only a supposed cure for a present ill. Now how can the medical faculty cure the present evil and unsanitary conditions? They have been at the head of the health departments since boards of health came into existence and here we are in every country just seething in filth. It is a wonder we have not more sickness than we have. These medical men are a necessary evil and we feel if they can study and teach the public more along

the lines of prevention they will fill a long felt want, and they can do so we are sure of that. Now we do not wish for one moment to make our medical men feel hurt by our saying these things, the sanitary engineers are more to blame than anyone. They have permitted these unsanitary conditions to exist and have known all about it. They are allowing anyone to get a license to put in sanitary engineering and while they are doing a little protesting, their protests are not strong enough, they need to thoroughly unite and protest publicly and openly and make the city fathers all over this fair dominion of our see that they are in earnest and that practical men only be allowed a license to put in the most vital parts that make our habitation sanitary and that the boards of health should have practical sanitary engineers as well as members of the medical faculty as part of the personnel on the boards of health.



VACUUM CLEANERS IN SMALL TOWN.

The idea has prevailed among a few hardware firms that the sale for vacuum

cleaners is confined chiefly to the dealer in the large towns and cities. This has not been the case in the town of St. Marys where the population is about 3,500 people. Last year J. M. Adam hardware merchant, sold thirty electric vacuum cleaners, a record of which any merchant in town that size should be proud. Mr. Adam sent the machines to the homes of prospective purchasers and in the majority of cases he sent one of his clerks to show the prospect how to work the cleaner. After instructing the customer regarding the uses of the machine he left it for a week on trial.

The result of his campaign was that he sold thirty machines, which is considered a large number of sales for one season in a town the size of St. Marys and which goes to demonstrate that the sale of cleaners is not confined to the larger places.—Hardware and Metal.

Sanitary Engineers would also find these small vacuum cleaners another good possible source of revenue and, further, those who would possibly require a large installation would be apt to call in and consult their sanitary engineer along those lines if the customer saw a small vacuum cleaner in his store.

The Trade is in Need of Men of Ideas

The Importance of Ideas, of the Initiative Which Finds the Remedy For Old Evils—Something About the Tile Drain Question and its Treatment in the City of Toronto.

Can any of our readers tell us the value of an idea? Our greatest scientists were at one time judged to be mere fanatics in more ways than one. Some of our greatest men to-day are termed as wizards. The whole world is ruled to-day by those men of great ideas. Titles and college educations shrink to nothingness in the whirl of modern ideas, especially if those ideas are possessed by men who have the natural qualifications to put their ideas into force.

In the sanitary engineering world there is more scope for ideas and the carrying of them out than in any other field. It is the one field that need ideas in the worst way. It needs men of ideas to break away from the old ways of doing things. We have men in our line of profession who still hold fast to the old ideas, and will not lend a ready ear to the man of new ideas. We have, too, a large number of fine men with fine ideas who lack the backbone to assert them for fear of the severe criticism they would be given by those of the same line of calling.

Let us look around at a few of the questions which the sanitary and heating engineers are confronted with. We have, first, the sanitary problems. Now, what are these problems? They are the disposal of sewage, the disposal of garbage, etc., and when we say the "Disposal" we do not mean the mere taking of it away from our places of abode to another place either by drains or sewers, or by the illegal mode known as cesspools, or even by carting it away in carts. Those methods are not to be called disposing of the sewage or garbage. We are having our eyes opened to the proofs that to date all, or nearly all, our cities are not as yet "disposing." Look at the city of Ottawa, look at Toronto, Montreal, and numerous cities all over our fair Dominion. All these are only displacing their filth from one place to another instead of working out "ideas" and encouraging men of ideas to get together and evolve methods of final disposal.

Then, take our methods of installation in our homes. We in the profession are even now allowing those who have not had the practical experience to over-ride us in more ways than one. For instance, here in Toronto we have by-laws made to control the installations of sanitary engineering. What has been proved to have been good for 25 or 30 years does not prove the fact

that it will be good for the next 25 or 30 years. The matter of using tile drain pipes under the ground in houses is ridiculous, and as is shown by the fact that severe tests were made by other cities all over the world, and after these exhaustive tests, the fact was proved beyond doubt that extra heavy cast iron pipe was and is the proper thing to have within the walls of a house; and, what is more, it should be suspended in the ceiling of the basement wherever possible. Whatever possessed our city sanitary engineers to allow those inexperienced City Fathers to dictate to them without having a clear case ready, and then showing in concrete form that iron pipes were best, is beyond the powers to conceive. It is enforced by law in the following cities:—New York, Buffalo, Washington, Cleveland, Detroit, Philadelphia, St. Louis, Baltimore, and has been for from 17 to 29 years. It has been permitted even in Toronto for upwards of 25 or 26 years. But only permitted. Now, why should this be? There is something wrong somewhere. These tile drains may have been good in quite a number of cases for a long period. But that is not the question. If only one case of a defective drain in one house is found that possibility is warrant enough to condemn that method and material as a conveyor of sewage through our homes.

The writer has taken out hundreds of feet of good tile pipe with the hubs in bad order, joints loose, and what is the result when such a thing happens? It means that if the cellar has been cemented a very slight leak will cause all the earth under the concrete to become permeated with sewage. It has been found by the writer to have happened, and death has been caused in more than one instance through such defective drains.

Not very long ago in a city near Toronto one case happened where two feet of the cellar had to be dug out and carted away because of the tile drain leaking and polluting the earth. The trouble, too, was not found out until a dampness was seen to come up through the concrete, although a bad odor was noticed several weeks before that, but as it was winter time and the ground was cold, very little notice had been taken of it. As the spring came round the matter became serious. Now, who knows but what one case such as is here mentioned may not be cause

enough to start a serious epidemic. It is surprising to see that men in Toronto, who have had such fine, up-to-date ideas regarding the building up of such a beautiful city, should be so backward along the lines of sanitation.

Where are the ideas for a system of garbage collection? None at all. The carts allow all kinds of filth to drop off along the streets. Garbage cans are left all along the public streets for days at a time, and even at best for several hours under the burning sun. No regulations, no set time for collecting this garbage, no covers on cans; in fact, no regulation can at all. How many cities allow the filthy air vent to be stuck out on every lawn, at every front door, to emit a filthy odor every time the w.c. is used? Not many. How many cities enforce the main house trap? Another thing of the fetish past. Where are our men of ideas? Some years ago one of our finest sanitary engineers stated that traps were a necessary evil, but could be dispensed with in five cases out of ten where they were in use. If there were only a few men of ideas who would speak outright and voice their ideas to the world along the sanitary engineering line, sanitation would take greater strides than it has done in the past.

Another of our greatest authorities stated several years ago that three-fifths of the back-venting was a myth; and, what is more, three-fifths of our sanitary engineers know it is, but they lack the backbone to declare to the world their views for fear of the unpopularity they would receive. So far back as 1910 one of the most responsible authorities when endorsing the principles embodied in the city of Cleveland plumbing code, and which claims the title of "Simplified Plumbing," stated in part: "The Cleveland code has many features which are unique. Perhaps its most striking characteristics is the extent to which it simplifies our plumbing designs. In approving this code, I am aware that I shall be criticized by those of my readers who believe in the multiplicity of pipes, who would have soil pipes, stacks, re-vents, back-vents, etc., all that with the belief that it is a good thing to complicate plumbing, because it makes it more expensive."

Now here we find a man of ideas, a man who knows he will be criticized by

(Continued on page 21.)



SHOP NOTES

Readers are asked to send in any Kinks they have with a view to helping the other man along. Every good thing is too good to keep.



HOW TO MAKE A SIMPLE TESTING APPARATUS.

First get a small tank to be used as a reservoir; put the necessary inlets and outlets for putting the pump on, and also for placing water in if necessary, then take a foot pump used for inflating the tires of a bicycle and solder a short brass nipple to the bottom, then screw on a check valve $\frac{1}{4}$ inch in size and attach to the tank to prevent a back pressure from the tank to the pump. Then on the suction side get a small vacuum valve such as used to be placed on a steam system of long ago. You have then got a simply compressed air outfit. This can be made in spare time by some of the boys in the shop and should be made to stand about 10 lbs. pressure. The top should have a connection to fasten a hose on which is then fastened to the test plug. Then, if a small amount of hot water, say about a pint, is got ready, and about an ounce of spirits of peppermint is put into it, then the whole poured into the top of the stack and the test plug or any other plug placed into the stack to prevent any leakage, is put in quickly. On this being done, give a signal to the fellow at the foot of the system to start and pump up to about 10 lbs. This, of course, being put into top of air tank. If there is any leak the gauge will tell and the location of leak will be found by the odour of the peppermint coming out. This method of testing is far better than a water test in winter and is not half so much trouble. No sanitary inspector will object to it either. It is a very handy tool to have round a shop for testing loops of hot water heating pipes or in fact any piping whatever.

METHOD OF FINDING OUT HEATING CAPACITY OF TUBULAR BOILER.

A safe method to find out the heat radiating capacity of a tubular boiler is to find out the horse power and allow from 75 to 100 square feet to each horse power, and to find out the horse power, a simple rule is to measure up the heating surface of the boiler then allow 15

square feet surface for one horse power. This, of course, refers to low pressure not more than two pounds.

BRONZING RADIATORS.

When bronzing radiators or coils always have heat on as the liquid will run better and give a very flat brilliant effect on the radiators. This will answer with any kind of bronze or other powders.

WHAT IS A VACUUM SYSTEM OF STEAM HEATING.

Many a steamfitter has the opinion that a vacuum steam system is a complicated installation as he views a vacuum as a mystery. But the whole thing is this in plain language: Fit up a small pump on the returns and air valves and pump the air and condensation back to the boiler or rather cause a suction to take place whereby a vacuum is created and you have a vacuum system. One of the chief reasons why such a system is the most economic is that water boils at about 98 degrees Fah. if a vacuum is placed on the water and when water boils it begins to release the Vacuum by displacing it with steam. Hence, heat is raised at 98 degrees Fah. as against 212 degrees when under atmospheric pressure.

SIZE OF COAL BIN NECESSARY FOR WINTER'S SUPPLY.

Many a heating engineer has been asked what size a coal bin ought to be and if he has any idea of the total amount the boiler or furnace should consume of coal during a winter. One safe rule is to allow 40 cubic feet for each ton of anthracite coal.

PUTTING WASHERS ON TAPS.

Many an hour is wasted by the sanitary engineer who is sent to put washers on taps which are situated at the bottom of a range boiler. He usually has to empty the boiler to do so, which takes

more time by far than the putting on of the washer. Here is a way which does not require the boiler to be emptied. First see that all the hot water taps throughout the building are closed and do not leak. Then turn off the water supply at top of boiler and proceed to take the tap apart under boiler which needs repairing. At first a little water will run out but as soon as a vacuum is formed no water will run and the tap can be repaired with ease. It is always advisable to take a new tap with you in case the seat of the tap is too badly worn. This can be put on just the same without emptying the boiler.

DIPS FOR VALVES.

How many heating engineers have been annoyed at seeing good valves on their shelves which have been put into a job for temporary heating and allowed to stand there and accumulate just because they have been used a while and look like old valves? Here is a good dip which will make them like new. First get two jars large enough for the largest piece to be cleansed. In one jar place one-half pint tin of lye in say one gallon of hot water and when this is going to be used it should be hot as it will act quicker when hot than cold. In jar number two put two parts of nitric acid to one part of sulphuric acid and mix. This is all. Number one jar with the lye in need only be used if the goods to be cleansed are greasy. Method for cleansing: first, if greasy, hang the article to be cleaned in the lye, then dip it in number two jar and rinse quickly in cold clean water.

If the valves have composition disc, these should be taken out as the acids will destroy them. These dips will make the valves like new.

RECIPE FOR LUBRICANT.

A very good lubricant to use on pipe cutting and threading is: Dissolve 3 lbs. linseed soap in 1 gallon of warm water and when cool it is ready for use.

Here is shown a simple plan of pipe steam system with a radiating capacity of 1,832 sq. feet. Part of these radiators were direct-indirect, viz: One radiator in each room. This system was drafted out for a rural public school and is one of which there are quite a large number in different parts of the country. A system, such as this, if properly installed with large enough mains, plenty of grate area and fairly good draft can be run very economically and with little attention. There is great trouble these days caused by insufficient radiation being allowed or a fear that too much radiation and boiler capacity can be put in but where there is one case of too much of either being installed, there are a thousand with too little of both. Then, again, it is not always the heating that is at fault. If a suite of rooms or house or even school or factory is badly ventilated, the heating is at a disadvantage as fresh air is far more easily heated or shall we say the heat is felt more if the air is fresh than if the building or rooms are badly ventilated. Again it is surprising that more direct-indirect radiators are not used both in steam and hot water systems. No one can realize the benefits derived by having one or two direct-indirect radiators in our homes particularly as well as in our school. Although at the present, the very best systems possible to be acquired are being put into our schools throughout the country, the rising generation will never know the conditions which their parents had to put up with in the schools where they spent their hours of study. The installation here shown with proper firing and as mentioned before with plenty of boiler capacity, with automatic damper and check regulator, can be made to give splendid satisfaction with just two fires a day, viz: a fire put on at 6 a.m. and the damper regulator set to work at one or two lbs. steam pressure at the most then attended to again at 6 p.m., all radiators to be fitted with good full-sized mains and all pipes reamed and where pipes are reduced, none but eccentric fitting used. These radiators, too, must have a good thermostatic aid valve, all of which should be set to close when the radiator is all hot and steam enough in to control the said thermostatic valve. Then, in the layout of such a plan, all mains must have at least a fall of one inch in ten feet and all branches to radiators or risers must have swing joints to take care of expansion and contraction and all mains should be covered with a good air-celled asbestos pipe covering. The returns, which will be seen are dry returns and each loop has a return of its own. Another good feature too, is to have a thermostatic valve at each return where it takes a

drop in a vertical course into the boiler. These valves should be connected into a Tee with a pipe carrying them as high as possible. They will act as an automatic air relief and will relieve all air from the mains leaving the thermostatic air valves on the radiators to simply take care of the air only in each respective radiator and thus not forcing all the air which accumulates in the mains to be driven through the radiators.



THE TRADE IS IN NEED OF MEN OF IDEAS.

(Continued from page 18.)

those who look to him as an authority on sanitation. But the moment their pocket is touched there is trouble.

If tile drains are allowed, then why in the name of reason are they not put to the same test as iron ones, and why not subjected to a water test along with the soil pipe stack? The stack is not put to half the strain as the tile drain. Further, it should be tested at the same time as the roughing in is tested. Then one inspection would be all that is necessary as regards the water test. The tile is called upon to do more severe work in actual practice than the soil pipe stack. Therefore, it should be subjected to a more severe test; and, failing that test, some other kind of drain pipe should be instituted by law that will stand the test; and there is not the slightest doubt that all pipes inside a residence or place where the human race spend most of their time should be subject to an equally strong test. It is not a case of dollars and cents to a great extent, because if a sanitary engineer could start at the outside of the house with his first length or fitting and follow on right at once, then put on one test, it's a question as to which would be the cheapest in the long run. But when safety, efficiency and sound value for money paid is taken into consideration the cast iron drain pipe is CHEAPEST. This question, too, is a public issue. It is far more necessary than whether we own an electric system or a car line, because neither of these will be any vital use to us if we are not in a good state of health.

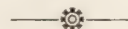
So waken up, you men of ideas. Let us hear what you have to say. We want your views so that others may read them. We have other questions of sanitation to discuss and would like one settling at a time.

We hope all our readers will read, mark, learn, and inwardly digest these and all other topics. Give us your

ideas, and do not forget that it is the men and women of ideas that rule the world and will rule it. Such men as Lincoln were men of ideas. Just let us quote a few to show what some of their ideas were. Lincoln, speaking of the future, said: "The dogmas of the quiet past are inadequate to the needy present. The occasion is piled high with difficulties, and we must rise with the occasion. As our case is new, so we must think anew and act anew."

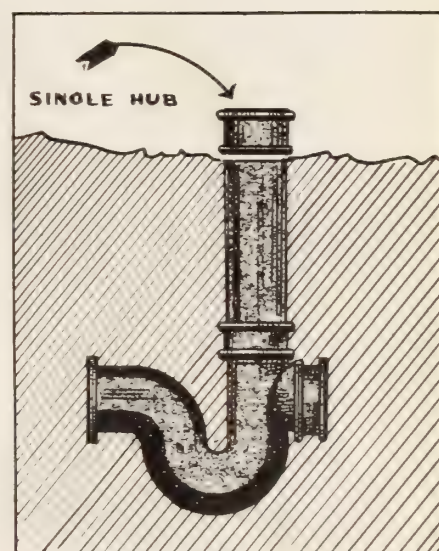
Speaking of ideas, Ingersoll said: "Let us develop the brain, civilize the heart, and give wings to our imaginations."

Benjamin Franklin must have foreseen the troubles of those who govern when he spoke the following words: "Those who govern, having much business on their hands, do not generally like to take the trouble of considering and carrying into execution new projects. The best public measures are, therefore, seldom adopted from previous wisdom, but forced by the present occasion."



NEW GOODS.

The Westport Mfg. & Plating Co., Ltd., Westport, Ontario, are placing on the market a single hub. They claim that by using this hub any short piece of soil pipe without hub can be used when extending a trap to the basement floor-line. They have had this hub



commented upon by different sanitary inspectors and all agree that it will be a useful addition to the users of cast iron soil pipe drains, and will also use up any short ends of pipe which is without hub, and has previously been thrown on the scrap heap. A sample will be sent to any one who wish to try one out.

Field Widening for Sanitary Engineers

Suggestions That Sanitary Engineers Should Devote Time to Studies Along the Lines of Sewage Disposal. For Country Residences and in Such Towns and Villages That Have No Drainage Systems.

The following is taken from a recent issue of the Toronto World:

Several Ontario towns now running under free and easy health regulations, and incidentally their death rates mount up annually through negligent practices, are about to be brought up short within the ensuing few weeks. The provincial board of health is camping on their trail these days, and acquiring information which will later be turned into the strongest kind of leverage to demand the installation of prompt and efficient sanitary services.

This rejuvenation comes as the fruits of the new policy of sanitary surveying, but recently instituted. Seven district representatives dividing between them the sum total of Ontario municipalities are daily journeying from place to place, and each town is subjected to the most rigid scrutiny of all matters pertaining to public health. Immediately, a complete report is forwarded to the chief officer, and in cases of neglected or careless management, a plan of action is decided upon and the advice of the board is forwarded in regard to particular matters. To ignore this advice, is to become subject to penalty.

Although no particular cases will yet be quoted by the board, it is understood that several towns throughout the Province and especially those bordering on rivers, have been found in a most deplorable sanitary condition. In some typhoid fever increases yearly, and the cause was very apparent to the health officer on his first round.

The water systems, conditions of public buildings, milk supply, care of fruit and meat in the town stores, prevalence of flies and methods to guard against them, care of streets and lanes, number of people and health record, number of physicians and their faithfulness to duty, and a score of other matters are all taken note of and filed for future reference in the department.

Some local eyesores and menaces to public health in different towns, which apparently have defied the efforts of citizens to have removed are now under consideration, and orders will be issued within a few days.

The department is much pleased with the success following the working out of the new scheme of district repre-

The above from the Toronto World goes to show that the field is widening for sanitary engineers. Nothing will give the country as high a standing as good sanitary engineering. It has been proved time and again that no measure constructed to cope with sickness of any description bear such good results as clean water supply, good sewage systems and a thorough final disposal of sewage. Not the mere emptying our drains into some local stream, lake or waterway. This method while tolerated to some degree is condemned by all and particularly by the different health departments. But the filthy method of cesspools and the like of emptying of sewage into our lakes, rivers, etc., has got such a firm foothold that the powers that be are really in a very unpleasant position in a way, but if our sanitary engineers will join hands with them to cope with this great evil, we shall soon be in a fair way to having solved, at least, the pollution of our water supplies. Whole countries have been made sanitary and almost free from disease by simply adopting sanitary measures and rigidly enforcing them. We cite one instance where the Island of Cuba before American occupancy was the scene of terrible conditions, and the city of Havana was a hot bed of yellow fever and all other diseases until sewage disposal systems, drainage of streets, closing up of thousands of cesspools were enforced. Some people stated that these diseases were brought about by the mosquito and began to swat the fly and mosquito for that reason, but they had to give up the foolish task they had begun as no results were evident, but scarcely had these new sanitary measures begun to be carried out that direct results for the good was very easily noted. So what with the present condition we find ourselves and the departments of health starting a crusade it is high time to awake and put on our studying cap and devote considerable time to the best method of sewage disposal and further who should be the best engineers as to the solving of engineering feats but sanitary engineers. The men who have had our drainage systems and our water supply systems have made some of the most serious

blunders that men could make. Engineering feats up to date have been largely left with college boys and the like and what has it cost us. We are to blame more than they. We have been satisfied to back down when mathematical problems have been necessary instead of waking up. We have the practical knowledge, why not acquire the rest, with all due respect to our college boy? He is only in the same position we are in ourselves as it were. We have the practice they have the theory. We need their theory and they need our practice. Why could we not get right down to business and learn our trade thoroughly? Previously we had a reason why we did not acquire this theory. It took money, but now we have our technical schools, our text books and almost every other help necessary, therefore let us study up these vital problems and start at the beginning, having acquired the theoretical with the practical we become full-fledged scientific sanitary engineers. Never was there such an opportunity for us to assist ourselves as the present, when the country needs all who are interested in any department of sanitary matters, to join hands when the governments of the different Provinces are making tests of our water supplies and investigating the different sewage disposal systems and even so far back as 1910 a law was enacted making it a crime to construct cesspools and the like, but we have not as yet seemed to grasp the matter firmly by educating the people in small towns and villages to the proper method of local sewage disposal, it is only by so doing that our water supplies can be kept assuredly clean. It is a well known fact that scores of wells which naturally yield the very finest water it is possible to procure are turned into veritable wells of poison and disease by the filthy methods prevalent by the use of cesspools and small French drains or seeping tile drainage. Hence by studying the problem thoroughly the field for sanitary engineers is becoming wider every day and further we shall be more worthy of the name we have recently adopted and be looked upon as a power for good instead of the name of plumber and all the titles some people feel should be ours.

Setting and Connecting Range Boilers

By PHOENIX

For years and years there has been very little change in the manner in which range boilers have been connected. Matters seem to have got into a rut and just stayed there. Now just why there should be the same number of turns and twists (approximately) no one seems to be able to explain. For instance, in the case of a connection why would it not be far better, quicker and more practical to connect them all as per the cut shown in this number? It is a sure thing that it would give an easier circulation, bring the boiler higher above the water front and consequently afford more hot water in the boiler. A few who have tried it pronounce it a decided success. One of the main difficulties is that boiler stands, in general, are not constructed so as to get this result. Or to put it another way, the water front is too high.

Now just because this is thusly, generation after generation of plumbers have gone on setting the range boiler along the same old lines and daily running up against the same old difficulties. Why not branch off a bit and have some new affairs to struggle with and to talk about? It would make it decidedly more interesting. When you install a boiler in the cellar with a regular tank heater it works to perfection. Then why not take the lesson to heart and try it one story higher, viz., in the kitchen? Put a range boiler horizontally above the kitchen range, on provided rests (as is customary on certain kinds of ranges) and again the range boiler works all O.K., showing that when installed above the water front the boiler does much better. Plumbers seem to forget that the tendency of hot water is to rise, a lesson which they would do well to impress upon their minds. It will also be noticed, in the case of this installation here illustrated, that it would be practically impossible to get the cold water inlet pipe on the inside of the boiler too long, a safety guard which is not to be too lightly regarded.

There are other ways of heating the range boiler than by means of the water back. A coil through which steam is passed is one and is practical. The writer performed this feat more than 25 years ago and did not think that he was introducing a new thing.

Another way is to make a coil of pipe

and use it in the stove in the place of the regular water back. This is done in cases where the stove to be used is an old one and there has been no water back provided for it by the stove manufacturer. The pipe coil will work all right and give most excellent results if it is well made. An objection is that the plumber is very liable to make use of any old pieces of pipe and that he will not even ream the pipe. This reduces the bore and gives a first-class beginning to the coils becoming stopped up later on. Pipes, only, that are entirely smooth on the inside should be used and they should be selected with the greatest care. If the threads are not cut true it will be found very difficult to make the coil come true. It will be as crooked as a ram's horn and work like 69 in the winter. Some plumbers like to make this coil out of pipe one size larger than the pipe they are running on the job, figuring on a larger heating surface being obtained thusly. If the range boiler is not too large a simple loop will be enough. In other cases more runs may be used. In some cases these pipe coils have been installed where they gave too much heat and it was found necessary to smother them a bit. This can be easily accomplished by partly enclosing the pipe coil in fire clay, the exact amount of covering having to be determined by experiment. Reduce the heating surface about 1-3 to begin on and the chances are that you will not have to do anything more.

There is another point I wish to talk about and it is this that many times the plumbing job is condemned for not giving enough heat when the fault is the owners. The plumber goes over the job and can find nothing wrong and is entirely at a loss to see the trouble for the time being. Let the plumber look to the stove, the manner in which it is run and also the owner. He may not know how to build a proper fire, or he may be of so "saving" a disposition that he won't build enough fire to heat the job. I have found many of such people in the course of my travels.

Again both stove and owner may be all right and the kind of fuel used not the proper kind; or the chimney may be "off"; in fact there are many little points that will cause the job to go on the blink before you know it. Its all in

a day's work, however, and the man who has been at the business generally is wise to most of these points, but the apprentice might get stumped and so we mention them again for his sake.

NEW BOOKLET ISSUED.

Steel & Radiation, Limited, of Toronto and Montreal, have issued a very interesting booklet, illustrating their new imperial radiators, with sizes and ratings of same. Every heating engineer should apply for one and will find it a very useful addition to his stock of data referring to radiation.

NEW BOOK ON VACUUM CLEANERS.

The Zimmer Vacuum Machine Co., Ltd., of 94 Adelaide St. West, Toronto, have issued a very attractive book on vacuum cleaners showing the various styles of their machines and capacity of same. Every sanitary engineer should write for one of these books from which they will find a lot of good information.

The vacuum cleaning business is one which sanitary engineers should be interested in as a new field to increase their revenue.—Editor.

MARKET REPORTS.

Enamelware is in steady demand, and all factories are working full time to keep deliveries prompt. No stock is being able to be kept on hand. Better class is called for than previously. Prices unchanged.

Lead is very steady, but inclined to have an upward tendency. Lead pipe is moving regularly, with medium stock on hand to make ready and prompt shipments.

Brass goods are steady, and prices unchanged.

Soil pipe stands at old prices, with a steady demand. Factories are kept busy, and are shipping their average output.

Black iron and galvanized fittings still remain steady and pipe is unchanged.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



WHAT'S WRONG WITH THIS JOB?

Editor, Sanitary Engineer.—I am running out of job that I was called in to look at. The complaint was that the boiler does not heat up properly. You will notice there is a kind of circulating pipe leading from close to the range boiler on top pipe of range connection to hot water pipe at top of boiler. It is a 60-gallon boiler connected to an ordinary water front in a common kitchen range. The range connections as well as the service is lead pipe. Do you recommend a circulating system for hot water supply? And can you please show me what is wrong with this job in your next issue, and how to remedy it.

Halifax, N.S.

M. W. N.

The pipe which is supposed to be a circulating pipe will not give any satisfaction as it is, and we have shown on Fig. 2 the proper way to install a simple hot water system. We strongly recommend all hot water piping to be put in with a circulating pipe, and it really is a simple matter once a man gets the idea. Further, it is the means of saving a lot of water. In some cities where a flat rate is charged for water the city authorities insist on all hot water pipes being laid on the circulating plan. Another thing which may be causing you trouble. You say the boiler has a capacity of 60 gallons. If that is the case, you must have a very large water front, as an ordinary cooking range water front would be too small. Let us know what size the water front is, as possibly that is where your trouble is. We also note by your drawing that the bottom pipe goes up and then down on its way to the boiler. Our plan will show you how the whole installation should be.—Editor.

DOES HOT AIR EVER HEAT WELL?

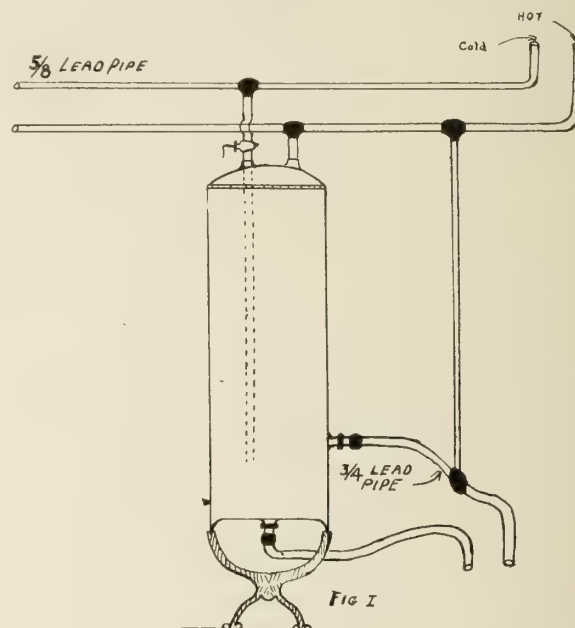
Editor, Sanitary Engineer. While this is bringing up an old and very much discussed question, I want to ask you very frankly if you ever knew of a place where a hot air furnace worked well and heated the house?—Editor.

We certainly do. There have been

many installations where hot air furnaces worked fine, but they were put in by painstaking men who knew how to put in the work, and not slap it in as the ordinary hot air job is installed.

LOCATION OF CELLAR CLOSET.

Editor, Sanitary Engineer.—Will you kindly tell me the proper location for a closet that must be placed in the basement?—Anxious.



Such a job has been found to cost nearly as much as a good steam job in instances which we have known.—Editor.

GETTING THE AIR OUT OF STEAM SYSTEMS.

Editor, Sanitary Engineer.—Is it a good plan to put an air valve at the extreme end of a long steam main? Does it help the steam to get to the radiators any quicker?—Helper.

Such a practice has been followed by many fitters for a long time. If the steam main is very long and quite large we do not think that it will accomplish all that is expected. We believe that more than one air valve should be used if quick results are expected. Place three or four air valves along the line and also the one at the end. You will get much quicker and more uniform results. It stands to reason that all of the air that can be taken from the main will not have to be pushed into and out of the radiators.—Editor.

Many times this particular closet is placed in any old corner so as to be out of the way. This is generally a closet of an inferior kind and the work likewise. It proves, in the long run, an expensive installation. The closet should be of the very best type, not necessarily the most expensive, and should be as well installed as any in the home. Lead pipe should not be used, as there is danger that the rats may do damage. Get as much light to the closet as possible, and if placed in a room have some means of ventilation. Low down closets will be found convenient.—Editor.

LONG BRANCH ON STEAM MAIN GIVES TROUBLE.

Editor, Sanitary Engineer.—A branch to a riser on a certain job does not clear as readily as it should, and makes a pounding noise at times. For all that it has the right pitch. What

would be the easiest way to cure the trouble?—S. S. T.

If the branch is over ten feet in length a sure way to dispose of the trouble is to put a drip from the place where the pipe becomes vertical, and return the condensation to the boiler. A ground return is suggested in this case. Another manner, and one of less trouble, is to make the branch at least one size larger than the riser. This last proposition is a good general rule to follow where the branch is over seven feet long and the radiator over 40 feet in size.—Editor.

RADIATOR CLICKS WHEN STEAM ARRIVES.

Editor, Sanitary Engineer,—Two of the radiators in my home give forth queer sounds whenever the steam is turned on. It sounds as if some one was trying to push them along the floor. Can you tell me just how to remedy the matter?—Owner.

From your description it is very probable that the steamfitter has neglected to make the proper allowance for the expansion of the job. Not having a plan of the plant we can not advise you definitely, but would suggest that you look at the places where the pipes come through the floor and connect with the steam valves. Now, if any of them are crowded to one side and hug the floor you can with a key-hole saw cut out the wood and enlarge the opening for the steam pipe. This may cure the matter. If it does not you had better call the fitter and have him discover just where the lack of provision for expansion is.—Editor.

SUPPLYING FROM MAINS BOTTOM.

Editor, Sanitary Engineer,—Would it be practical to supply three or four radiators on a steam job with steam that is taken from the bottom of the steam main? I can thus get a better pitch to the main and the room is scant.—Fitter.

It is entirely practical to supply the radiators in the manner that you suggest provided that you take a drip from the end of the branches and slant the branch towards the drip; in other words, so that the condensation and the steam shall flow in the same direction. This practice is many times followed where the head room is scarce or where it is desired to measure the condensation for some purpose.—Editor.

"HOME-MADE" PIPE COVERING.

Editor, Sanitary Engineer,—I wound the steam pipes on my job with one thickness of asbestos paper and one thickness of common paper, and can

not see that it makes any change in the way the job works and the saving of coal. Would it do better if more covering was applied?—R. S. D.

The covering you used was not thick enough and could do little good. Compare it with the regular commercial pipe covering from the point of thickness and you will see that you did not have one-quarter enough. You should have had at least four thicknesses of asbestos and some six or eight of thick paper to do much good. We very much doubt if in attempting to make up a covering of your own that you will gain anything over buying outright the regular pipe covering which is well prepared for the purpose. If you cover the pipes with the regular covering, you will very soon discover that your amount of fuel is less, and that the heat is kept out of the cellar.—Editor.

CONNECTING AN EXTREMELY LONG STEAM COIL.

Editor, Sanitary Engineer,—Will you please tell me a good way to connect the pipes of a very long steam coil? I

which a fitter joined up a coil over 400 feet in length. The "harp" was made and first hung. From the bottom of the harp and "P" the ends were started towards each other, and brought as near as possible, with the result that the different measurements represented by the figures shown in the space in centre of coil were all the measurements that had to be cut.—Editor.

BRICK SET VS. ASBESTOS COVERED BOILERS.

Editor, Sanitary Engineer,—Which would you advise, from a practical point of view—setting a steam house boiler in brick or covering it with asbestos?—Practical.

Years ago it was thought to be the proper thing to enclose the boiler in brick. Later experience seems to have shown that it is of very doubtful economy, and that the asbestos covering is the better practice. This should be put on at least three-fourths of an inch thick on the sides and about an inch and a half on the top. Put it on in three separate coats, and you will

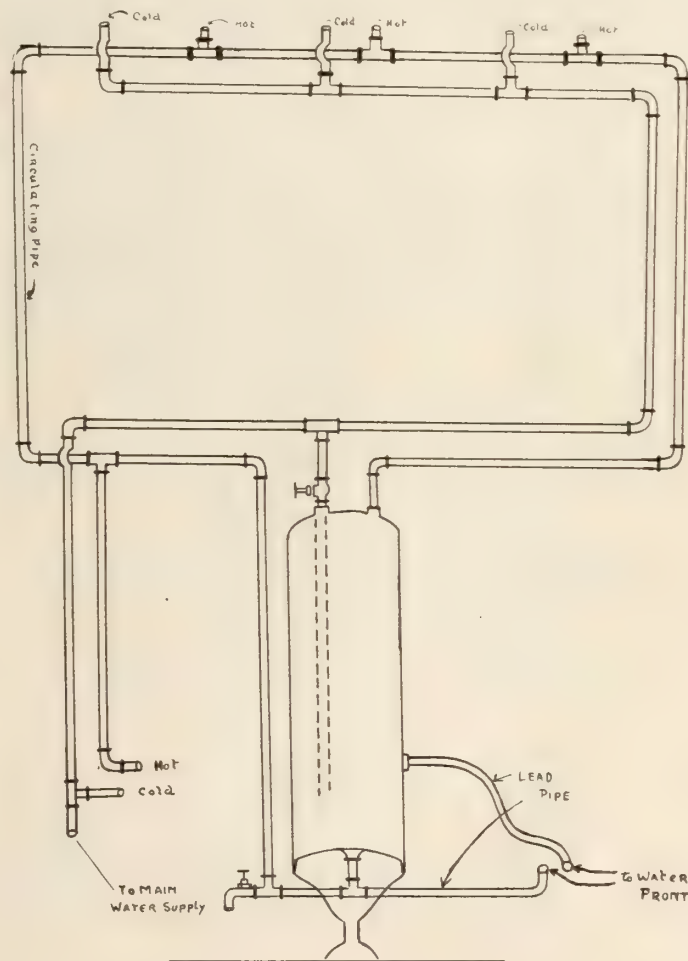


Fig. 2.

have several to build, and the men seem to do a great deal of unnecessary work at it.—John R. Rodgers.

Examine carefully figure 3 in this issue. Here we show the manner in

have a better job than as if you attempt to make it all in one coat. In expelling the moisture from one coat it is apt to swell and bulge and not prove a success.—Editor.

SUPPORTING AN INDIRECT RADIATOR.

Editor, Sanitary Engineer.—Will you please illustrate some of the best ways of hanging an indirect radiator and thus help one who reads your paper with interest?—M. J. Rowe.

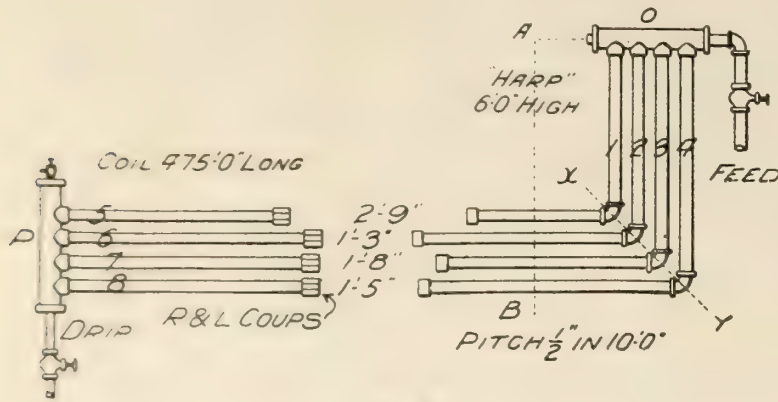


Fig. 3.

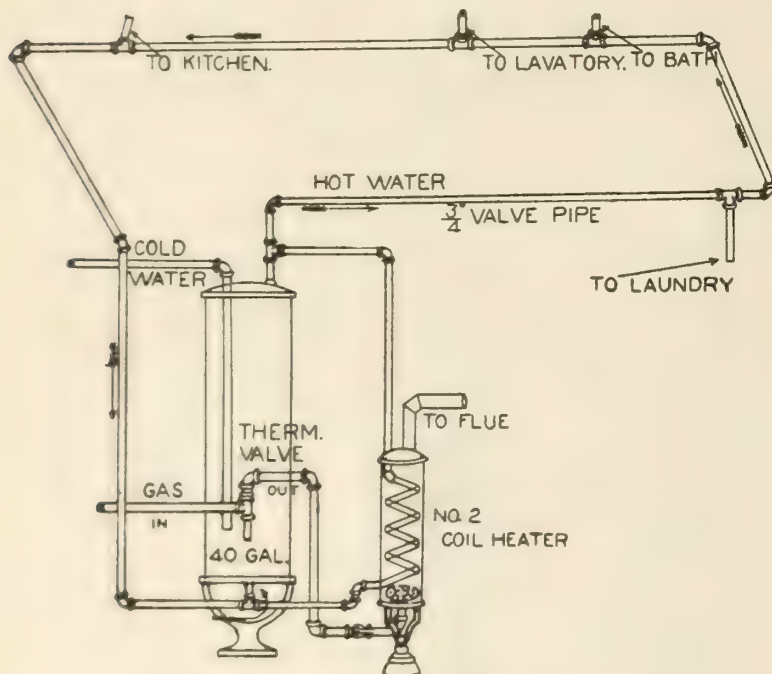


Fig. 4.

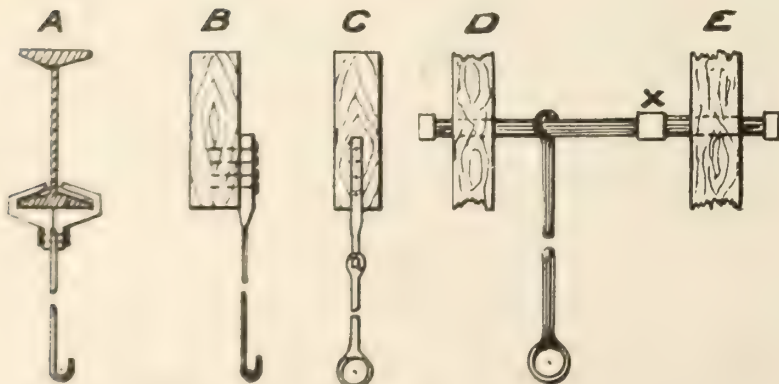


Fig. 5.

In figure 5, differently lettered we show some of the ways that the fitter uses. There are others but these are very common. The one represented by "D. and E." has many advantages, although it is not the quickest to install. For iron beams "A." will be found very convenient.—Editor.

GAS HEATER RANGE BOILER AND CIRCULATION.

Editor, Sanitary Engineer.—Please show a gas heater connected to range boiler and on a plumbing circulation plan.—Journeyman.

In figure 4 we show a lay out that has the advantage of having been installed and tried out and found to work very nicely. The man who put it in, however, failed to show a draw-off clock on the job, and you will please imagine one installed so as to clear the range boiler and draw off the water when desired.—Editor.

RADIATOR TRUCK.

Editor, Sanitary Engineer.—Will you please show me the way a good radiator truck is made?—X. X.

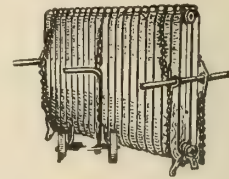


Fig. 6.

In figure 6 we show a combined truck and radiator carrier that is said to be very convenient for the purpose wished.—Editor.

BOILER FOUNDATION.

Editor, Sanitary Engineer.—In setting up the boiler for a house job is it desirable to make a foundation for the boiler, or just set it on the cellar bottom?—L. M. B.

If a cement cellar bottom it may be set on the same, but from the point of having a deep ash pit it would be much better to have a special foundation of brick. If the cellar floor is of dirt, it is absolutely necessary that the boiler have a good solid foundation laid two or three days in advance of the boiler's setting.—Editor.

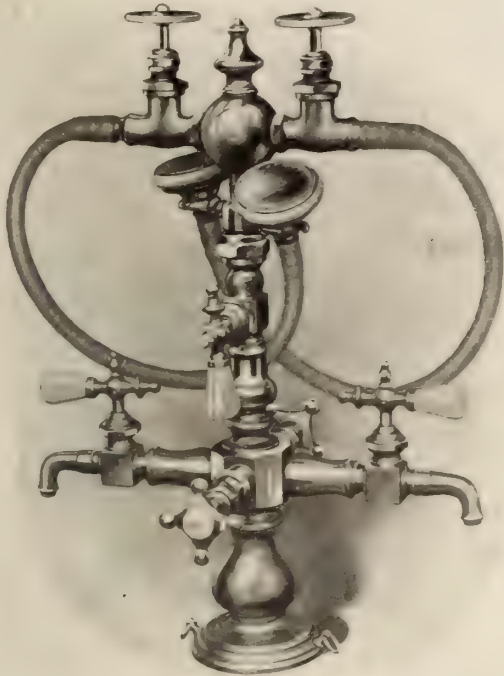
CONTROL OF THE TEMPERATURE.

Editor, Sanitary Engineer.—Is it better to have a temperature controlling apparatus in connection with a heating job, or will the regular automatic damper handle the job all right?—Flats.

It depends upon the building. For a single dwelling we believe that the automatic damper will, in the average, be found very satisfactory if rightly adjusted. For large buildings or apartments where several different temperatures may be desired, we believe that the temperature apparatus is desirable.—Editor.

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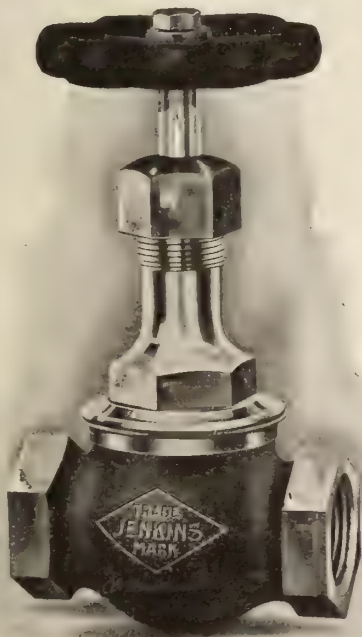
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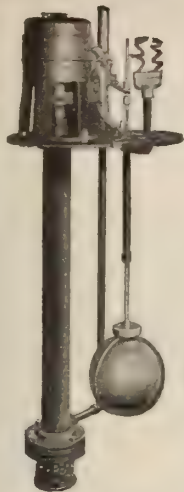
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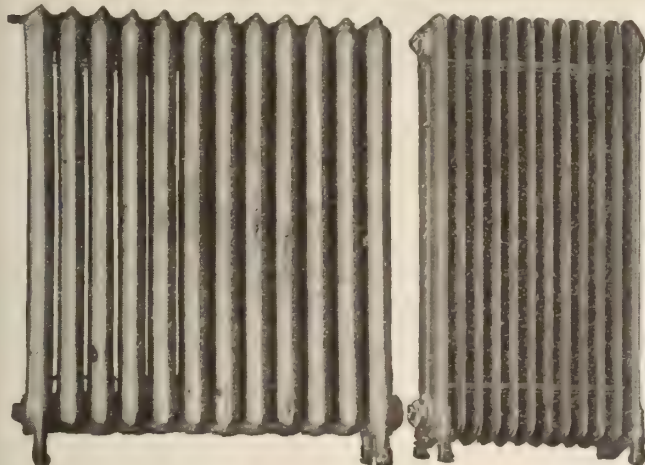
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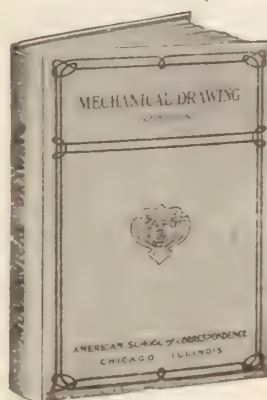


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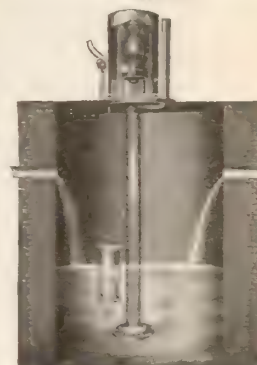
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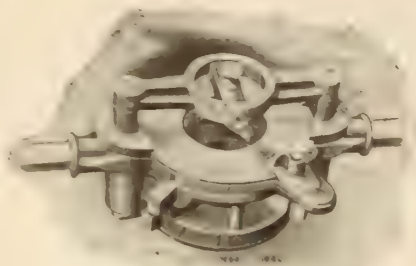
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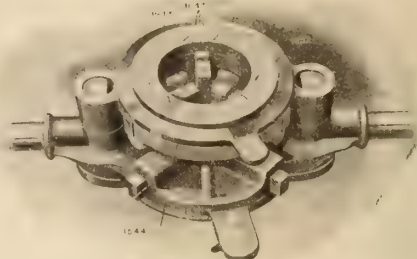
Die Stock Open



1648

Two Dies in One

Threads pipe 1 to 2 inch right and 1 to 2 inch left with one set of dies.



Rear View of Die Stock

The "Premier" does away with leader screws and nuts—and with much trouble. It starts itself on the pipe, also throws itself out after a "Briggs" Standard Thread is cut instead of backing off which spoils the dies.

No loose bushings to carry around or lose.

The die accomplishes in going over the pipe once what any other make would do in going over twice. Works so easily that a novice can operate it. The kind of die stock for which you have been look

It will prove itself invaluable.

Write to-day.

Borden-Canadian Company, 66 Richmond Street East, Toronto, Ont.

**Here It Is
Mr. Plumber**



The New "Dale Ball Cock"
For Low Down Tanks
With Hush and Refill Tubes
(PATENTED)

The elevated "Dale" is now a reality—
Noiseless—Positive Action—Simple Construction
—Instant Adjustment—Guaranteed. Use it also, the
low down "Dale" pattern for high tanks and your Ball Cock
troubles are ended.

Ask our salesman to show you a sample of it and to quote
you prices or write us and we will quote you.

Canadian Wolverine Company, Ltd.

Chatham, -:- Ontario

Manufacturers of High Grade Plumbers' Supplies of all Kinds

QUICK PRESSION WORK



Bath Cocks
Basin Cocks
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Plain and Hose Bibbs

Combine Beauty of Design and Finish with Effectiveness and Ease of Operation.

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Stamped With Our Name

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If you have not used any of these New Pattern Valves, specify "KERR" in your next order. We want you to get acquainted with the most reliable valve on the market.



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When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

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Kerr Engine Co., Ltd.,

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Walkerville, Ont.

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Representatives:

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THE CONSTRUCTION OF EMPIRE TANKS

is the best guarantee of their
lasting qualities.

The wooden dowels and tongue
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the joints from splitting or
opening.

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Vol. VII.

Publication Office : TORONTO, AUGUST 1, 1913

No. 15



THE STANDARD

COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA



COLONIAL—PLATE F109

Porcelain Enameled Allover Lavatory on Pedestal, with Compression Combination Supply and Waste Fitting, $\frac{3}{8}$ " Supply Pipes with Stops and $1\frac{1}{4}$ " Close Connection Trap with Vent.

Ideal "COLONIAL" LAVATORY

A "Medium Priced"
High Grade Fixture

Actual Size 22" x 27"
Oval Bowl, rear outlet $11\frac{3}{4}$ " x $14\frac{3}{4}$ "
Apron 41"

F109 Complete, as described—List.	\$63.00
F109 Less Fittings—List.	30.50
Approximate Weight.	205 lbs.

WRITE FOR CIRCULAR.

BRANCH OFFICES AND SHOWROOMS

<p style="font-weight: bold; margin: 0;">TORONTO</p> <p style="margin: 0;">119 KING STREET EAST</p>	<p style="font-weight: bold; margin: 0;">MONTREAL</p> <p style="margin: 0;">42-44 BEAVER HALL HILL</p>	<p style="font-weight: bold; margin: 0;">WINNIPEG</p> <p style="margin: 0;">76-82 LOMBARD ST.</p>	<p style="font-weight: bold; margin: 0;">VANCOUVER</p> <p style="margin: 0;">410 CARTER COTTEN BLDG</p>
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THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

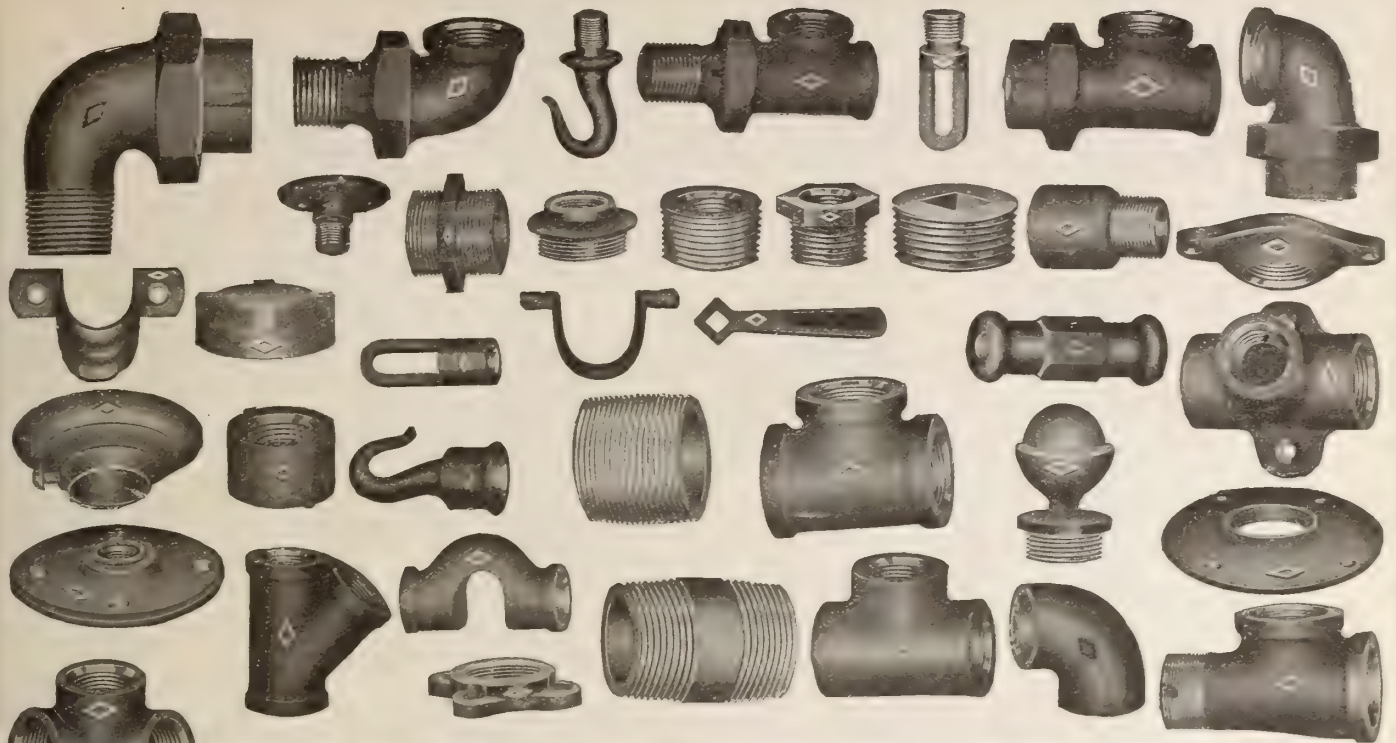
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CATALOG FURNISHED UPON REQUEST



"Standard Sanitary"

Modern Bathroom



Design P-65.

As bathrooms are planned to-day they represent the most luxurious part of the house, the most inviting place of comfort and source of health. The fixtures must of necessity be efficient and sanitary and always retain these good qualities, and in order to give complete satisfaction, the designs and the arrangement must be given the strictest consideration.

In selecting the plumbing fixtures for the bathroom it is often a difficult matter to choose designs that are best adapted to the various conditions and requirements. This difficulty can be largely overcome by installing "Standard Sanitary" fixtures.

For variety and quality "Standard Sanitary" fixtures are unsurpassed and no matter what design, their sanitary efficiency and service value is of the same high standard.

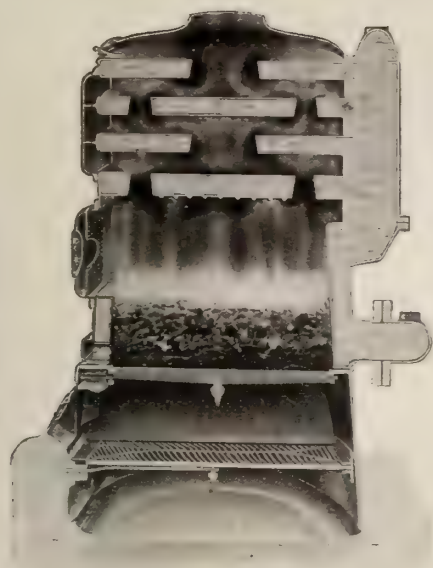
When specifying "Standard Sanitary" plumbing fixtures, make your specifications complete and emphatic by insisting upon the "Standard Sanitary" Guarantee Label. It is a mark of guaranteed quality and insures satisfaction.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:
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55-59 Richmond Street East.

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The
“DAISY”
 Hot Water Boiler

Over 50,000
 in Use

Speaks for Itself!



WARDEN KING LIMITED, MONTREAL
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 IN
 CANADA

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 The MECHANICS' SUPPLY CO., QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
 The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



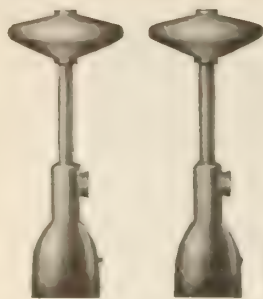
Our
“VIKING”
 BOILERS

For STEAM or HOT WATER

Are Giving Great
 Satisfaction

They are easily regulated
 and kept clean.





HONEYWELL HOT WATER HEATING

For more than forty years scarcely any fitter in America thought of sealing a hot water heating system.

A number of the older fitters knew the benefits of sealing, but they had nothing to seal their plants with but mechanical valves, and they would not think of using them. However, occasionally one was used and occasionally trouble resulted. Either corrosion would render the valves inoperative or foreign particles would lodge under the valve seats and cause them to leak and therefore become useless.

For this reason the sealed system of hot water heating was looked upon unfavorably until 1906—forty years after water as a medium of heating was first used in the United States to any extent—at which time the Honeywell Heat Generator, the safe and dependable mercury seal, was invented. Then the sealed system grew in favor by leaps and bounds, until to-day there are upwards of 130,000 Honeywell Heat Generators in use. They are to be found in every country where hot water heating is used. They are now made in Canada, England and the United States to supply the demand.

The Honeywell Heat Generator, the Honeywell regulating instruments and the Honeywell method of piping, make the most satisfactory and economical system of house warming known to present-day science.

Honeywell Heating Specialty Company WABASH, INDIANA

Frank T. Rawley, Canadian Manager.

Room 1008 Eastern Townships Bank Building, Montreal.
Phone Main 4615



Hot Water Quick Opening Radiator Valve.

"MILLER" Hot Water and Steam Radiator Valves

The bodies and bonnets of our Hot Water Quick Opening Radiator Valves are made in one piece, thus having a great advantage over other valves, as it leaves one less joint or possible leakage. The cone-shaped Disc prevents sticking.

Our superior Steam Radiator Valves have very low seats and a high lift of Disc.

We manufacture both valves from 1/2 in. to 2 in., with or without union, also union elbows.

Every valve is thoroughly tested and has an unlimited guarantee. They are built for service. Ask your jobber for them.

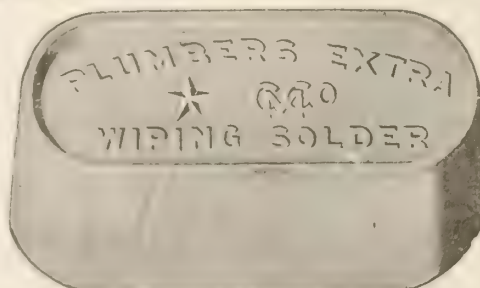


Steam Radiator Valve.

MILLER LIMITED - LONDON, CAN.

PLUMBERS' EXTRA STAR

The Highest Grade
Wiping Solder. The same
price as Cheap Solder.
Why not use the Best?



For a First-Class Joint
buy the Solder with the Tin
in. Particular Plumbers
Use only Extra Star Wiping.

Manufactured
and Guaranteed by
Fraser Ave., TORONTO

The Canada Metal Co., Limited
MONTREAL

WINNIPEG

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.



Figure No. 112 B Peerless Water System

No More Leaking Air Compressors

The air compressors on hydraulic-pneumatic pumps have always been a source of trouble. Their construction required the use of a packing gland inside the water chamber and also a check valve, both of which almost always allowed water to escape to the floor. Repairing them is a nuisance to the plumber.

Owners of these pumps also cannot be brought to realize that when pumping air the handle must be driven to the **EXTREME END OF ITS STROKE**, otherwise the air is **COMPRESSED ONLY** and **NOT EXPELLED** into the tank. **Result, a kick.**

The device above illustrated entirely overcomes these difficulties and is the most important improvement in hand-operated pneumatic systems in recent times. **By merely turning a pet cock** on a specially designed device air is delivered to the tank at any time, in any quantity, with no additional effort. **And no leak.**

Shipped to you exactly as shown—can be set up in an hour. **NEW PRICES THE LOWEST IN AMERICA.**

National Equipment Company, Limited

Sorauren Ave. and Wabash Ave.

Toronto, Ontario

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VII.

TORONTO, AUGUST 1, 1913

No. 15

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The MacLean Publishing Co., Limited

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SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

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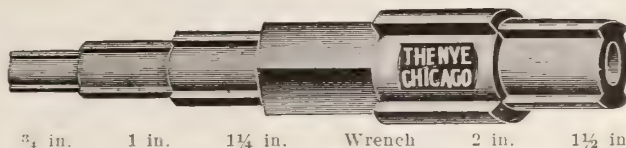
W. S. Farquharson, *Associate Editor*

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The Strong Man Asks No Favors

When he tackles a piece of work
he does it. Nothing Buffaloes him!



Price 75 cents net each

The Nye Union Valve Nipple Wrench Is Like a Strong Man. It Works

It is made of the best material. It never slips. It is light and easy to handle. It does not mutilate the nipple.
It lessens the profanity output and tickles like a feather duster.

I don't ask you to believe in the superiority of the Nye Wrench until you have been shown. Drop me an order and I'll ship you the tool on a free trial. It is so different from the cat, it will never come back.

Nye The Die Man

The Nye Tool and Machine Works

124 N. Jefferson St.,

Chicago, Ill.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



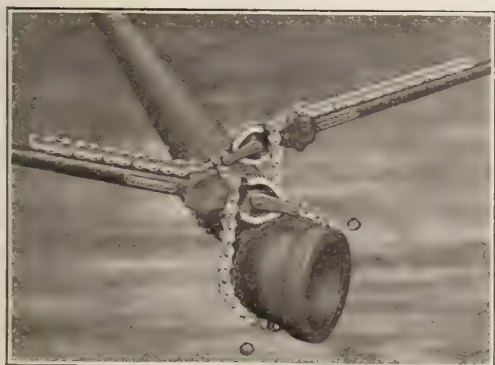
Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

ONE TOOL FOR ALL THINGS!



"Agrippa" Pipe and Fittings Wrench

The single jaw will do everything that is possible with the parallel jaw tools and more when the operation is cramped or the fittings lack in gripping surfaces.

It will grip upon surfaces where the ordinary tool "can't."

It will do work which the broader jaw tool "won't."

It will give you more and better service than can any screw-adjusted wrench made.

It will start the rusted pipe or fitting when all else fails—just the service you have a right to expect in a fully warranted tool.

The price is in your favor, too!

J. H. WILLIAMS & CO.

SUPERIOR DROP FORGED PIPE TOOLS

77 Richards Street
Brooklyn, N.Y.

40 So. Clinton Street
Chicago, Ill.

Making up a 6" 45 on the line.

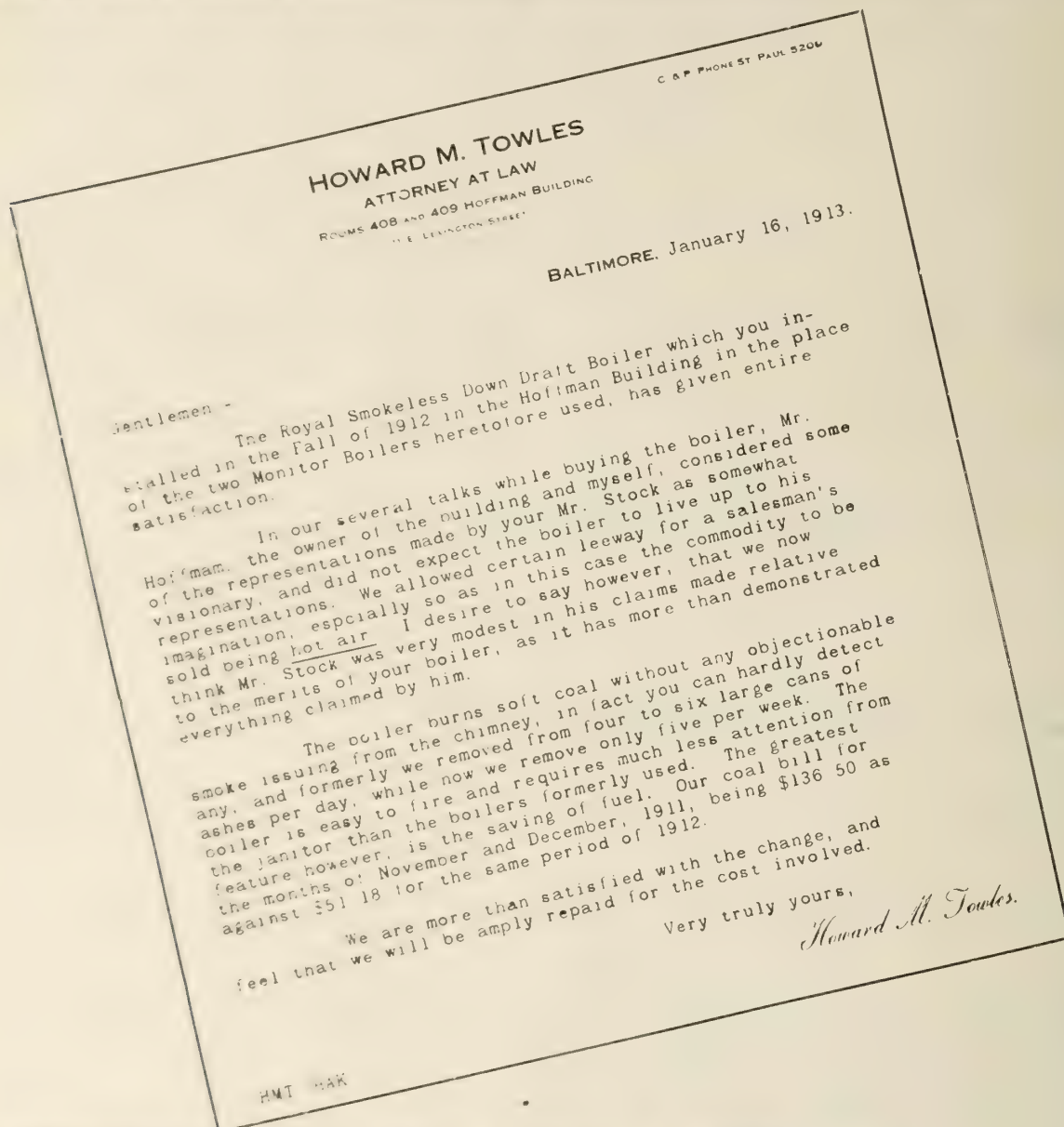
Always place the chain across the jaw before locking

We Guarantee The ROYAL SMOKELESS WATER TUBE BOILER to Save 25 to 33 $\frac{1}{3}$ per cent. of Fuel

The double grate and combustion chambers of this boiler are so arranged that 90 per cent. of smoke is consumed, thus effecting an enormous saving in fuel.

Soot cannot collect in chimneys, smoke being practically consumed. Very little soot clings to the flues of the boiler. It burns soft coal and eliminates the smoke nuisance. Requires very little attention. No brick work necessary in connection with this boiler. Not necessary to tear down a section of building to instal—the Royal can be carried down any ordinary stairway—in sections.

A 4,000 square ft. Royal Smokeless Boiler is the one used in the Hoffman Building as per following letter.



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Branches:

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Agencies in all the leading Cities in Canada



Fig. 1.



Fig. 2.

Sanitary Engineers Past and Present

Messrs. Bennett & Wrights, Toronto, One of the Most Progressive Companies
Practicing the Profession of Sanitary Engineering—Began in a Humble Way
in the Year 1875—Now Have Upward of Three Hundred on Their Payroll.

In no part of the world has there been such progress made along the lines of sanitary, heating and ventilating engineering as is evidenced in Canada and U.S.A. Large companies with fine places of business can be seen all over our cities. In Toronto, there are several who employ from one hundred to three hundred men and the magnitude of the installations put in by these firms are wonderful. Messrs. Bennett & Wright, Ltd., of Toronto, have recently completed one of the largest and finest installations on the continent. In a later issue we hope to have a complete set of plans showing the whole lay-out of this installation which we feel will be interesting to our readers. Bennett & Wright's began business in a very humble way in comparison to the size they are now. In the year 1875, Joseph Wright and James Bennett founded this now large enterprise with a few men along with themselves, and soon proved their necessity to a city like Toronto. After a period of two years, James Bennett was called to the Great Beyond, leaving Joseph Wright by him-

self to forge along this great business. At that time gas-fitting was a big portion of their business and by looking at Fig. No. 1 will be seen a store, the windows of which are of an ancient style and displaying a large quantity of gas fixtures, these, too, are a type of the long ago. The business progressed in no small way under Mr. Wright's direction and with the able assistance of the very capable staff he was able to gather round him, one of which we must not fail to mention in the person Daniel McCrea. Dan is still in the employ of the company and is 85 years of age, having been in their employ for 30 years. And by the way, he can operate some of the machinery used in this wonderful concern. He seems good for many more years. The writer saw him operating some of these machines and he certainly can put some of our young men into the shade. Fig. 2 shows a newer design of window and a more up-to-date display of goods. This storefront is only the smallest part of the business; the company have added to their premises from time to time and

carry a larger stock of the different fittings, piping and fixtures than many a supply house. To go into this array of material would be a task of no mean order. Suffice to say, a carload of soil pipe and fittings would not be missed from their stock and other commodities held for disposal are in comparison. A display of the very best class of goods can be seen by looking at Fig. 3, which only portrays the one half side of their show room. Fig. 4 is the interior of their office which is large and spacious. There are fourteen desks in this office and another office is also situated on an upper floor used exclusively for estimating; 4 desks are necessary for this staff. In the office shown there is a private telephone switchboard connecting any desk or member of the staff in the different departments. There are 4 shippers kept busy in this establishment and no goods once received are allowed to be taken away without an order from the office. The size of jobs, too, vary greatly, one would think such an institution would only cater for large installations, but that is not the case. This



Fig. 3.

present year, jobs have been done and invoices rendered for such work ranging in value from as low as 75 cents to \$300,000, and to cope with such work we must not forget the workshop and stock sizes of pipe and fittings used, along with the staff and plant necessary. In their workshop which it is needless to state, has taken many a turn on the road to progress, there is at present one of the finest lot of machinery running that money can buy. The writer well remembers the time when cutting a piece of 2-inch pipe with a No. 2 wheel cutter was quite an achievement if accomplished in 5 minutes. Here, in this shop, there are machines that are cutting the same size in exactly 5 seconds without any effort on the part of the man operating the machine. Another pipe-cutting machine was timed and cut a piece of 4-inch pipe in 7 seconds with no more effort. The time saved on cutting one-inch pipe for indirect pipe coils is a marvel. There are also several splendid pipe-threading machines, one of which cuts and threads from 4 to 12-inch; one for 2½ to 10-inch; one from 2 to 4-inch; and one from ¼ to 2-inch. There is also a double-headed nipple machine with reamer attachment and independent heads which will thread nipples from ½ to 2-inch, any length. All these machines are fitted with self-oiling apparatus which is operated by one pump only and all oil or threading compound is conveyed to

a lower floor and pumped back into an overhead tank. No waste of oil is seen by this arrangement. There is a large radial drill and smaller one, also, a general purpose grinder and an automatic tool and cutter grinder is used; a blacksmiths' shop is situated in one corner. Another splendid feature in this modern workshop is the overhead tracks used for lifting and conveying the large sizes of pipe. These tracks are installed so that a piece of 12-in. pipe can be unloaded off the trucks or wagons and taken straight to the large power threading machines without the least effort, and, of course, such pipe can be taken out of these machines as well, and re-loaded. When asking Mr. E. F. Wright about the workings of their workshop he gave a very genial smile and said: "Oh, yes, you may look round the workshop, and if you want any information about it you'd better ask 'Hughie.' He knows more about it than me." And Hugh Ashfield certainly knows a little about pipe cutting and threading, having held the position of shop foreman for over 15 years. He, too, has seen a few changes in this shop. The times were when it was considered quite a task to cut 4-inch pipe, but "Hughie" takes an order for so many pieces end to centre of 12-inch elbow or tee, or centre to face of flange of an 8, 10 or 12-inch size with just as little concern as if it was 5 o'clock. Then another branch of Bennett & Wright's

business which is last but by no means least to comment upon, and that is their hauling or cartage department. When one is told that this company use upward of half a ton of caulking lead every day, they must also use a lot of soil pipe and fittings which will need a lot of handling. At one time, in addition to their own teams, the company had to pay from \$10 to \$15 a day to outside cartage companies and lost more than that sum by loss of men's time waiting on jobs for material. The development of their business, too, was materially retarded. Room taken up by horses became too valuable, until at last they launched into the motor truck method of transferring their goods, men, etc., to and from their different jobs and so great has the success been of this enterprise that at present they have an array of trucks, cars and auto cycles that one wonders how they are kept busy.

Then their foreman sanitary engineer has an auto to take him round to the different jobs. Their heating engineer has a motor-cycle. Mr. Clapperton, their vice-president, has to make his regular rounds to the different contracts in an auto. Then, E. F. Wright could never cover the ground he is called upon as secretary-treasurer without his car. Joseph Wright, the worthy founder and president of the company, too, takes more business than pleasure by calling into service a fine automobile. One and



Fig. 4.

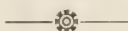
all were at a loss to know, however, they were able to cope with the cartage problem in the past and vow by all above not mentioning below, that it would be an utter impossibility to do the large amount of business so economically had they not taken to motor trucks. Up to just recently they had only three trucks, but have just acquired another three-ton truck, making four in all, viz: two 3-tons, one 2-ton, and one 1½-ton. Each one of the company were very sure that the adopting of motor trucks had been one of the chief factors in the expansion of their business. Every sanitary engineer who is worried about his deliveries should go into this matter very carefully and by the use of motor trucks in their business will find they have adopted a plan which will solve that part of their difficulties. And more than that, in conclusion, while motor trucks have played a very important part in the business of Messrs. Bennett & Wright's, our readers must not forget the fact that every up-to-date machine which it was possible to acquire has too been the means of helping along this wonderful concern. How many of our sanitary and heating engineers are using the same old tools, the same old machines, and applying the same old methods throughout their business as they did years ago. So wake up and remember, you are becoming a back number. Some I can hear saying "Oh, yes, it's alright for these fellows, but

they've got the price." Yes, and so have you got the price. You are paying more in wages per year than would buy these machines and you had far better be struggling to pay for machines and up-to-date tools than paying for time lost by using tools which should have been on the scrap heap years ago. And since Plumbers and the title of plumbers has been scrapped, let us see a few more adopt new methods, use newer tools and become sanitary, heating and ventilating engineers. And in conclusion let us thank those gentlemen and members of the staff who so cordially gave their time and attention to Sanitary Engineer while collecting the basis for this very interesting article which reflects great credit to the firm of Messrs. Bennett & Wright, Limited, Toronto, and governed by

Joseph Wright, President.

George Clapperton, Vice-President.

E. F. Wright, Secretary-Treasurer.

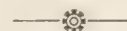


RESTORATION OF CONFIDENCE.

Cleveland, Ohio, July 24.—The Iron Trade Review says:—A gradual restoration of confidence among both buyers and sellers has been one of the most encouraging features characterizing the markets the last ten days. New buying of finished lines is light, but consumption of finished and semi-finished products continues heavy, and ware-

houses are being called upon to furnish a large volume of prompt material. Prices of the heavier lines are being well maintained, but weakness continues to be experienced by the sheet and wire markets, and pig iron prices are soft. Sentiment is better. The fact that warehouse business continues rather brisk is encouraging to mill owners, inasmuch as it indicates that deliveries, generally speaking, are still considerably deferred.

Pig iron sales have brought out lower prices on all grades, but dealers appear more optimistic about the future than a week ago. Complaint about the prevailing price of coke continues to be heard, and the proposed 88 cent rate on Lake Superior iron ore to Wheeling and Pittsburgh has been one of the chief topics discussed this week. The Standard Sanitary Mfg. Co., the close of last week, bought 3,500 tons of No. 2 foundry at \$13.65, valley, and 500 tons of gray forge at less than \$13.50, valley.



An announcement was made on July 25 by Willis Booth, president of the company, that the Hot Point Electric Heating Co., which now has its central plant at Ontario, Cal., will immediately build a large branch manufacturing plant in Toronto. The Canadian plant will cost \$250,000, and employ from 124 to 150 hands.

Heating and Ventilating Our Homes

Heating and Ventilating Should be Under Some Authoritative Board as Well as Our Sanitary Systems—Heating Systems Should Be Sanitary—Tuberculosis Assisted in a Large Degree by Badly Ventilated Homes—Method of Hot Air Heating Installations Should be Looked Into and Changed.

Here in Canada we have some of the finest and most up-to-date methods of heating and ventilating systems on the continent. These of course are in our large buildings of a public nature. Our apartment houses. Our flats and tenements are not so well equipped as they should be. Our sanitary authorities are paying better attention to the installation of bathroom and lavatory accommodation and their necessary piping, back-venting, reventing, etc. They also are beginning to insist on what is known as "local vents." These are merely a system of pipe lines which have a hood placed in the ceiling over the W. C. to carry away the obnoxious odors from the room where the W. C. is situated. These pipe lines are generally made of heavy gauge galvanized sheet iron, and terminate into a heated flue or chimney, and in large apartment houses there are occasionally special ventilators with revolving hoods. However, these do not constitute ventilation of the whole house. Now why should we not have laws of health to govern the proper ventilation in our residences? If we had we should very soon see a change for the better. Our death rate would be lower, our vitality would increase. Our powers of immunity would be increased and we should see a less number of cases of tuberculosis. Why have we so many cases of tuberculosis? The simple reason is, we close our homes up too tight. We do not provide a proper method of ventilation. We are allowed to build our homes any way our fancy prompts us. Ventilation is never considered. Our architects never ask us what system of ventilation we desire in our homes. But our heating and our sanitary accommodations are provided for sometimes in a very elaborate style. Now has it ever occurred to those who are contemplating building a home, or even to our health authorities that a proper ventilating system was more necessary to our health than either of the two systems before mentioned? Why does our health authorities allow this wholesale system of generating of tuberculosis by improper ventilation? It may be a startling statement, but we have more cases of that dread disease as well as others of its kind, we have more physically weak people in this fair Canada of ours as the direct cause of badly ventilated homes than from any other cause. Now "Sanitary En-

gineer" takes the stand of prevention, and if we advocate a cure it is only as a preventative measure. Sanitary engineers should be ventilating engineers and the method of heating should be sanitary. When a heating engineer is asked to install a system of heating, he should see that it is a sanitary heating system. How many of the hot air furnaces are installed in a perfectly sanitary way? Not one in ten thousand are. And why? Simply because our health authorities have not looked into this matter of proper ventilation in our homes. If there had been a foul odor caused by the way these hot air furnaces were installed we should have heard about them long ago, but the present method of installing these furnaces is low priced (not cheap). They are the cause of more run down physical systems than any other source. Therefore are dear at any price, and are costing us some of our best lives. These and in fact all heating and ventilating systems should be under a sanitary board of health, which should be comprised of practical, sanitary, heating and ventilating engineers along with our medical brethren. If hot air furnaces are to be installed, they must be installed in a sanitary manner, and not as at present. Now to properly ventilate our homes, it must be done in conjunction with our heating system, that is a fact without doubt and beyond dispute, and can be done equally well by all three methods, viz.: Hot water, steam, or hot air. By hot water a number of direct indirect radiators should be used and steam radiators of the same type, too, can be got. They are on the market and manufactured by all those firms who make the ordinary style of radiators. They are fitted up with controlling devices to open or close at will. Several of these radiators in each home would be sufficient to keep the air pure and warm, acting, of course, in conjunction with proper outlets in the top of the rooms, where the foul air could escape. Hot air furnaces, too, if installed with cold air ducts, bringing their supply of air from the outside, these ducts to have controlling devices to control the supply of fresh air, and also the necessary foul air outlets at the ceilings of each room, and in conclusion let us take a passing act. We have laws for the prevention of adulteration of almost every thing we eat or drink. Yet, in our homes,

the very places where we rest our physical anatomy we are poisoning ourselves by inhaling and re-inhaling air which we poison as it were by the very fact of having to exhale all the air we inhale after taking out of it all the natural vitality we can and we go on polluting and repolluting the air in our badly ventilated homes, partly by improperly installed heating systems and non-ventilation. In a future issue we will show how to properly ventilate our homes.

NEW BOOKLETS.

Messrs. Bark & Barstow Mfg. Co., of St. Louis, Mo., have sent out a very interesting couple of booklets along with data sheets, referring to What is Known as the Cameron System of Sewage Disposal. Those who undertake to install such appliances would do well to acquire this information, which will be gladly furnished by the above company.

A very interesting booklet is being issued by The American Auxiliary Heating Co., 6 Beacon Street, Boston, Mass., on Forced Hot Water Circulation. This book should be on the shelf of every heating engineer. Some very fine illustrations are shown and any one having a sluggish hot water job on their hand should certainly write for this book.

TRADE NOTES.

Prince Albert is to have a large plant erected at some later date by the Imperial Steel and Iron Co. for the manufacture of iron piping. It is expected to give work to upwards of 4,500 hands.

Galt has added another Artesian well to its water supply. This addition will greatly add to the efficiency of the plant. There is a rumor that a large reservoir may be built in the near future with a capacity of three million gallons.

Galt is to be congratulated in no small way. They possess three sets of sewers, to take care of storms, surface and domestic sewage. While their septic tanks are doing a good work as can be expected, they are a little overworked on account of the rapid increase of population.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorriman, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, AUG. 1, 1913

PRACTICAL EFFICIENCY vs PRICE CUTTING.

In our last editorial the subject taken up was Lost Time, etc. It pointed out several ways which caused a loss of time to those in the sanitary engineering trade. It pointed out to a certain extent that, while this time was lost and not directly charged to anyone, it was and is a partial cause for less efficiency being given to the public who are getting work done from time to time. Those who are getting houses built, whose sanitary engineering is being installed are paying indirectly for the time fretted away by those who go from firm to firm to get tenders on work which may incur too much outlay of money and is never done. Several of our readers have spoken in no small way, voicing their opinion that this time should be paid for by those who call for it. It is a shame the way the public try to huck and barter down the prices and tenders they get, and it is still worse when we find a man or company willing to meet another supposed lower price of a competitor. Not long ago an instance we will here relate actually happened where several people were asked to quote prices on a given job. One price was \$215.00, and another price was \$195.00. Well the party asking for prices went to the one whose price was \$215.00 and said: "Now look here, Mr. Jones, you have done my work for so many years and there is a matter of \$20 difference between your price and another one I got and if you care to take the job at this man's figure you may have it." Now here comes the test for efficiency. Here comes the time when you are going to fall, Mr. \$215 Man. That is if you are not careful. But you take the job for \$195. You have done worse. You have put thoughts into your customer's mind which possibly were not there before. You have practically self-condemned yourself of being guilty of trying to get \$20 more out of an old customer than you could do the job for. Your customer leaves your establishment with the idea he has beaten you down \$20. He leaves with the idea that you have possibly been overcharging him right along. He watches this job and looks for every fault he can find. He actually makes you do more than you at first bargained to do and you lose money on the job. You invariably lose your customer too in the end. Now why in the name of goodness was it necessary for you to drop to the other man's price? Here was your best chance of get-

ting your own price. You have been doing your best for some time for your customer and when you were estimating on the work you had this fact in your mind. Hence you were very careful about it. Your customer comes and says: "You have done my work for so and so long, etc. I would like you to do this job also, etc." Why did you not stick up for what was an honest quotation? Here you should have said: "Well, Mr. So and So. I'm very sorry but I really cannot do this work for any less price than I have quoted and guarantee the work. I took into consideration that you were a good customer of mine and that the job was to be as good as reasonable cost would admit, and if I do it for you Mr. So and So, I stand back of the job, etc., etc. Nine times out of ten you would land the contract. Your customer would feel he was giving you your price and it would be up to you to do a good job. You would be above any suspicion and a free agent to do as you at first intended and even if your own price was found to be low after getting so far on with the work it would not pay you to skimp it. No, you have been paid your own price. Its up to you to make good. Further in a case where you have lost on your own estimating, you have a chance to find out where you went astray, but never skimp a job in any case, because if you do a good job, one which you are not ashamed of, it is a standing asset to your business. It will bring you more business, and the money you have lost is not actually lost but rather invested in the good-will and reputation of yourself and the business you are establishing. But, on the other hand if you skimp it, the whole amount of the job is a life-long liability which dollars and cents will not wipe out. You make a dissatisfied customer. You have given yourself a bad piece of advertising and are everlastingly paying for it. So, whatever you do, stick to your price, reason it out with your customer and you will almost always land the work. Never forget that a good job is a man's best asset but a poor one is an ever haunting liability, and by taking a contract at a lower price than you at first quoted to say the least is bad business. You have given your customer every reason to believe you have always been charging too much, but when cornered are willing to come down. So stand everyone for efficiency and the end will not be far off when this scandalous price cutting will be at an end and more efficiency will be the general rule in sanitary and heating engineering.

Costly Sequel to Typhoid Epidemic

A Call for More Study Being Given to the Laws of Sanitation—More Public-Spirited Men in Our Profession and less Apathy on the Part of Those Engaged in the Craft, the Responsibilities Which, on Account of the Profession Chosen, Are Laid at the Door of Sanitary Engineers.

To see a man walking homewards carrying a big bottle of water under his arm, or, perchance, drawing it behind him in a child's waggon, is the curious sight that meets the stranger's gaze in a city of Eastern Ontario. When he seeks to learn the reason, he discovers that this is an aftermath of a typhoid epidemic that occurred two years ago. There is plenty of water for household purposes, but drinking water costs 10c a gallon. It is bought and sold like any other beverage. One passes stores where the window-dresser has exercised his art in arranging water-bottles artistically. Advertisements recommending this or that kind of water are displayed upon the bill-boards and on the screens at the moving-picture shows. Hotels and restaurants specify on the menu the variety of water supplied to their patrons.

The situation above described may be interesting, but it should never have arisen. When we reflect on the addition to the already high cost of living, the added expense to which the city must sooner or later be driven to provide a pure water supply, the financial loss it has already suffered in providing medical attendance and hospital accommodation during the epidemic, and, above all, the lives lost and the homes saddened during that outbreak, the importance of jealously guarding a public waterworks system from contamination is borne in upon us. Let other cities take warning, for in no other department of civic government will carelessness or parsimony reap a more sure or more terrible punishment than in that which is concerned with Public Health.

There is not a city to-day but what to some extent is transgressing in matters of sanitation, while our cry is for pure water supplies, we are polluting both our own and some other city's supply. The question is, which of the two schemes is the most necessary; to cease polluting our present water supplies and evolve a new scheme or system of water supply filtration; or, go to another source for our supply. As sanitary engineers, we favor that we cease to pollute our present one and adopt a good system of filtration, the powers that be have done their best in a sense, but what are our present day responsibilities? In Winnipeg we are told that in 1901 over 2,000 deaths had been caused

than half were due to preventible diseases, due to unsanitary conditions of one kind or another. What are we doing along the lines we practice? Are we rising to the occasion as is necessary, or are we only practicing our profession for the mere dollars and cents? If we are, then we are unworthy of the craft. What is lacking in this craft is public, brotherly sentiment. We lack good sound arguments, not because there are none, but because we do not study enough and become more versed in the Laws of Sanitation. We are to blame for this state of affairs. We have allowed our craft to sink into a mere trade; a mere means and nothing more than the gaining of wealth, and what is the result may we ask again?

50 per cent. of our deaths are preventible. Just stop and think a moment. How many have been caused by poor, low-priced sanitary installations, by foul drains, etc.? Some time ago the writer was in Montreal and heard of an instance where a child had died rather suddenly. It had not been very well and was taken out to get a little fresh air. It was on the road to recovery, when all at once it took sick and died suddenly. The doctor asked a few questions, etc., and began to examine the surroundings and found an open vent pipe in the vicinity where the child had been resting. And how many more cases could be cited if we took the trouble to investigate? Now we may try to shirk these responsibilities, by saying we cannot get representation on our city Boards of Health, but why cannot we? Simply because we have a past to retrieve. We have to show the public that we have awakened to the facts of our natural responsibilities; that we are now ready to be fair to the public. Show them that we are not a class of rich men. There is not a craft or profession in existence who show the lowest ratings in Dun's or Bradstreet. If our charges have seemed high. Why? Simply because we have, up to the present day, been employing men who have not realized their position and responsibility to our brother men. Men who have not had the necessary education to feel their own position regarding the Brotherhood of Man. Another reason, and a very good one, too. There is not a trade or profession which requires so much real skill as sanitary engineering

in our homes. For instance, any ordinary man of education, or one naturally handy around a house, can do a simple job of woodworking, painting, plastering, put in a pane of glass, lay a carpet, frame a picture, make odd pieces of household furniture and a thousand other little odd jobs round the house. But when it comes to connecting a drain, repairing a lead or iron pipe, fixing the W.C. and even putting a washer on a fuller cock, where is the handy man? Hence he feels what seems so easy to the skilled sanitary engineer should be as low-priced as a carpenter, glazier, painter, etc. Now it is up to us to raise the education of the public and to make them realize the relative value of our skill in comparison to the different trades, and once that is done we have a clear case. We must become more public-spirited, more gentlemanly and line up to the high standard of our calling, each doing his little part. There never was such an opportunity as at the present, when such conditions are existing; when our public are being forced into paying twice for water. The water bottles and jars and millions of dollars going into the coffers of the private individual because of having to buy pure water. When Mother Nature gave us pure water and in most cities in Canada even placed it right at our doors, and we who should have protested years ago against pollution of our water supplies, remained mum. So let us rise to the occasion and be heard by the public more often, and we shall soon be looked upon as the real custodians of the problems of sanitation.



Montreal is increasing the capacity of its waterworks system by laying new pumping mains, due to the increased demand. It would be interesting to know how much of this demand is the results of leaks in the domestic plumbing systems. Here is another instance where Water Is Money.

* * *

Woodstock has cause to be thankful that they have a good man to look after the sanitary conditions of their town, and it is up to them to see that Sanitary Inspector Robinson is given all the encouragement necessary in both remuneration and authority when matters of sanitation are at stake.

Drains: Soil Pipes and Main Waste Pipes

All House Drains Should be of Extra Heavy Cast Iron Soil Pipe. Certain Rules as to Weights of Soil Pipe and Number of Fixtures Allowed on Same in Saskatoon.

The following paper was read at the convention of western sanitary engineers recently held in Calgary by Geo. G. Taylor, Saskatoon:

Before taking up the consideration of the above subject, in the first place it would be well to define the term, house drain and house sewer, concerning which there is often some confusion.

The house drain is that part of the horizontal piping of the drainage system of any building into which all soil and waste pipes discharge.

The house sewer is a continuation of the main drain from the point where the latter ends to its connection into the main sewer.

There has been at all times, more or less, a difference of opinion as to the weight of pipe that should be used in house drains and the length that they should terminate outside the foundation wall. I would suggest that all house drains should be installed with extra heavy pipe, 13 lbs. to the foot, in 4-in. piping, and that they should extend outside the foundation wall at least ten feet. The reason for this requirement is, the danger from broken earthenware pipe and cement joints close to the foundation wall, with a consequent danger of the leeching of escaping sewage through the foundation wall.

I am of the opinion that all house drains or branches when laid underground should be of extra heavy tarred cast iron pipe. This is required for the reason that uncoated cast iron pipe is in time destroyed by galvanic action when laid underground, especially in case of unevenly cast medium soil pipe. I might say that in Saskatoon we have been using heavy soil pipe altogether. This was asked for by the master plumbers who did not feel like carrying a stock of medium and extra heavy pipe. They claim that it was hard to get. If we should form a provincial code, this will be overcome. Manufacturers will be in a better position to supply extra heavy pipe should it become compulsory to use it in all towns. Also that heavy cast iron soil pipe can be more evenly cast, with fewer defects, sand holes and cracks and that it can be caulked with less danger of cracking pipe and fittings.

House drains should not be less than 4 inches in diameter with a fall of one-

half inch to the foot towards sewer connection.

All house drains should be properly supported with brick or cement supports underneath each joint, and all changes of direction should be made with Ys, one-sixth, one-eighth, or one-sixteenth bends.

Cleanouts for house drains should be formed with a Y and extended without change of direction.

I would also suggest that an inspection chamber be placed at a point in the basement close to the place where drain enters building. The reason for this being to get a smoke test applied to the plumbing system of any building should at any time any infectious disease happen to break out.

I would also suggest that at the base of each soil pipe, instead of using the usual bend or Y and eighth bend, that a long sweep bend with a cast iron support be introduced with the necessary clean-out for the house drain on top and that the extra heavy soil pipe should terminate at this point and the medium soil pipe extended through roof with proper supports at each floor. In cases where no basement exists extra heavy pipe to be brought to the ground floor.

Each basement should be drained into a pit in cellar or basement, not less than 12 inches square and 12 inches deep below the floor line, which pit should be laid in cement. The water collected to be discharged into the house sewer through a deep trap of cast iron; this trap to have a seal of not less than 2½ inches. The pit to be covered with a proper grating for the prevention of solid matter getting into the sewer.

I would also recommend clause 44 of by-law No. 382 of the city of Saskatoon regarding soil and waste pipes, which reads as follows: "All soil and waste pipes shall be of not less than the respective diameter set out in the following table, viz.:

Pipes.	Diameter.
Main soil pipes	4 in.
Main soil pipes for water closets on eight or more floors	5 in.
Branch soil pipes	4 in.
Main waste pipes	2 in.
Main waste pipes for kitchen sinks on five or more floors	3 in.
Branch waste pipes for sinks,	

baths and laundry tubs..... 1½ in.

Or when set in ranges of three

or more 2 in.

Branch waste pipes for wash

basins 1½ in.

Branch waste pipes for other

fixtures 1½ in.

I would further suggest that all sink waste pipes should be 2 inches in diameter; that all soil and waste pipes shall be constructed of cast iron, galvanized, asphalted, or wrought iron, galvanized or asphalted steel. Branch waste pipes, except sink waste not exceeding ten feet in length, may be constructed of lead. Such lead pipes shall be not less than the following weight:

1¼ in. 7 lbs. per lineal yard

1½ in. 9 lbs. per lineal yard

2 in. 12 lbs. per lineal yard

3 in. 18 lbs. per lineal yard

4 in. 24 lbs. per lineal yard

Waste pipes from baths or basins shall not be connected to water closet bends or traps.

Terminals of all soil and waste pipes to be increased 2 inches in diameter before passing through roof and shall be located not less than ten feet away or two feet above any opening, window, door or other opening in same, or any other or adjoining premises in existence when work is getting installed. No such pipe terminals shall project or be exposed to the outer air for a greater length than 2 feet, or 1 foot above roof.

For roof caps, I would further recommend section 39 of Winnipeg By-law No. 59LO, viz.:

"All terminals of soil, waste and ventilating pipes of four inches in diameter or less, shall be increased at least 2 inches in diameter before passing through roof of premises. The portion of all pipe terminals above the roof shall have a hub and shall be protected by a double casing of galvanized sheet iron, the inner casing to be at least two inches and the outer casing to be at least 4 inches greater in diameter than such pipe terminal, and the space between such outer and inner space shall be packed with hair felt or other suitable material, and the whole shall be made waterproof by a cap fitting tightly over the casings and pipe, and caulked into the hub, or by such other suitable device as may be approved by the city engineer.

Pointers on Solder and its Users

How to Detect Poor Quality and What to do When Foreign Metals Get Mixed Into the Solder.

How many of our craftsmen to-day know really what solder is? It is certainly a matter of very great importance as no profession in existence at the present time uses more of that commodity called solder. In the days of long ago one of the first things an apprentice wished to know was, "How is Solder Made?" now even the best craftsman never gives it a thought. Of course we all know there is solder and solder. Our very best guide when buying this material ready made is "Who is the maker? Is their reputation any good? Are the staff who melt this solder up to be relied on?" If they are then you can rest assured the solder will be o.k. It has become an industry almost of its own during the last few years and when once a man has got used to one class of solder, his employer will never do wrong by keeping to the same grade even though the price goes up a little as against the prices of some other firms. Cheap solder is the dearest and most expensive thing a sanitary engineer can buy.

Now to come to its ingredients, which are few. Good plumbers' wiping solder is made of five parts lead and one part tin, providing both these metals are of first-class quality. Even these vary and to be sure of good solder they must be above suspicion. No more tin will improve the solder if either the lead or tin is of an inferior quality. A first-class plumber will be able to almost tell with the naked eye whether his solder is good. One very good way is to get it to a heat just below a red, when running out on a stone. This, if the solder is a good quality and the right heat to pour, it will have bright mottled silvery spots on its surface. But if too cold, it will be a dull white. If, however, the solder has a dirty appearance, there is an evidence of poor ingredients. Either the lead or the tin has some foreign mineral matter. Sometimes these can be removed by getting the solder very hot and in a larger pot than necessary then adding a quantity of powdered resin and tallow mixed together like a paste. Neither of these substances will harm the solder, but the foreign matter will be attracted by them and cause any objectionable substance to rise to the top, thus allowing it to be skimmed off. Some of these impurities are of an earthy nature but will not float without some assistance from what is known as fluxes and both tallow and resin are good fluxes for solder.

Then again even when melting solder and in the pouring, great care should be taken as tin is much lighter than lead and if not well mixed and stirred slowly the tin will rise to the top, the specific gravity of tin is 7.3 whilst lead weighs 11.445.

There is also another great enemy sometimes found in plumbers' solder and that is zinc. The man who tries to wipe a joint with solder containing the very smallest particle of zinc is almost bound to fail. If zinc is present a good way to detect it is by getting the solder hot again and pouring on a stone slab when the zinc will show up by the solder having dull crystallized spots on the surface.

In wiping with solder containing zinc, the first thing to be noticed will be a dirty thick drossy formation on the surface on top of the pot and if an attempt is made to pour it on the joint it will set almost instantly and if touched at once before colling it will break off very brittle, the same will happen if a soldering bolt is being used. It will become lumpy and have an appearance as if there was dirt in the solder. There are several ways to clean zinc out of solder. One is by pouring the solder on the ground or slab of stone and breaking it up into fine granules before it cools. Then put it into an earthenware jar containing hydrochloric acid also called muriatic acid. Some know it by the name of spirits of salts. This will dissolve the zinc. Then take out the solder and wash it and return it to the pot to be used.

Another easy and very good way to clear zinc out of solder is to get a quantity of powdered sulphur. Wrap it up tight in two or three thicknesses of paper then get the solder hot and place the paper with the sulphur into the pot and hold it down with a small ladle until the paper is burnt off. Then mix the sulphur well into the solder and the zinc will be attracted by the sulphur and will be drawn to the top like dross. Carefully skim this drossy substance off and throw it away.

The same methods of cleaning solder may be adopted whatever kind of solder it is.

Then there is solder which is used with a soldering bolt. This should be made of one lb. pure lead and one lb. pure tin and is known as strictly half and half solder.

Then let us consider a simple flux for use when soldering lead, block tin, brass or copper pipe.

Take powdered resin and good clean rendered tallow, about as much resin as the tallow will take up and still retain the consistency of tallow. The writer has used this for over 20 years and found it an excellent flux, although there are quite a number on the market which give very good results and are far better than carrying both tallow, resin and tallow and resin mixed.



HANDLING THE TEMPERATURE.

Editor, Sanitary Engineer,—Is it possible to so regulate the boiler of a steam or hot water job that the house will not vary in temperature more than five degrees in all kinds of weather?—Kicker.

Some people, by giving careful attention to the heating job, have probably been able to accomplish it, but trusting to the average human attention and opportunities does not always bring the most desirable of results. Why not make use of some of the inventions that have been brought about in the last few years? Many temperature controllers are on the market that will control the temperature of the rooms as may be desired. In fact if our inquirer will look up our columns of New Sanitary and Heating Goods in this issue he will find the latest improvement on the market so far as we know. This relying on a rule of thumb method of temperature control is dying out.



CATALOGUES AND BOOKLETS.

The Chadwick Brass Company, Hamilton, Canada, have issued their first illustrated catalogue section of art metal goods, brass house furnishings and hotel supplies. For convenience the catalogue has been designed on the loose leaf plan, and as soon as new designs are added the company will mail reproductions, so that by binding them in with the sheets already in the catalogue the dealer will always have a complete catalogue. The catalogue consists of 42 pages, and is attractively gotten up. Among the lines illustrated are fire sets, fire dogs, fenders, coal hods and boxes, mantel sets, cuspidors, jardineries, fern pots and baskets, umbrella holders and pedestals, candlesticks, tea kettles, crumb sets, trays, smoking sets, hotel supplies, curate stands, bathroom fixture, etc.

How to Figure Up a Job of Heating or Sanitary Engineering

Comments and Criticism on a Heating Installation Recently Completed—
Simple Suggestions for Preparing Plan and Layout of Such a Plant.

Here is one of the reasons why the sanitary and heating engineer is looked upon as a rogue and other things too numerous to mention. Now if a job of heating is not properly specified by the architect or the owner, it's up to the engineer estimating on the job to put things right at once, and say right at the start what is wanted, and then tender on what he thinks should be done. There are too many who are ready to give and figure on what is specified when they know quite well the job won't work. But they seem to think they are only doing as they are asked to do. Let me say right here, they are to blame if a job does not work, because they should have pointed out the weak places. There are lots of architects who would not stand for being told that a job of heating plans was not laid out right. But why, let us ask? Why should they tell us engineers our trade? Well, the reason is here. They always have done it. How would they tolerate us telling them how to draw a set of plans of a house? They'd not stand it for a minute, and I wouldn't blame them.

But we are considering now a plain job of heating, of from a few hundred to four or five thousand feet. It is up to the Heating-Engineer to do more studying and for the new blood which is being learnt the trade to start right and work a job out on paper before the first piece of pipe is cut. It was a very different proposition years ago when one was never sure what kind of boiler was going in, and when the thousand and one things to be had now could not be gotten, when a shop kink was a secret and if a fellow got to know how to do a job in an easy way he would send his helper off to the shop for a left hand monkey wrench for fear of him finding out how the job was done. Those times are over. If a lad wants to learn the trade no one can pull the wool over his eyes, and it's just the same in the Sanitary Engineering line. Get a sketch or plan of your job before you start on your job and you'll find you will have less work to pull out than is done in many a case. Now-a-days, fittings are standard and soil pipe is a given length. Leadbends can be got any length. Ferrules too are either long or short and are a given length. Traps are, too, so much centre to centre, and every manufacturer of Fixtures has a plan of the roughing in measurements. So a plan first is the ideal thing. It also

gives the helper a chance to study. From the helper's standpoint, look how interesting for one if he began to draw fittings of all kinds and put the measurements of them down centre to centre or end to centre, then to study how much thread or a ferrule takes up. He would be laying down the first laws of apprenticeship in no mean way, and before very long would be able to lay out his job first on paper and work it out in real practice. But, whatever the job be, heating and sanitary engineering, take pride in the job. It's just as big an asset to you as the price. A good job is an asset, a poor one is a liability, whether you get your price or not.

There's not a man in the heating line but what has lost on many a job of heating, and the more pains he seemed to have taken the more money he seemed to lose on the job. How many in the first place go at it the right way? Not one in 20 do. Now, before we go into this matter let me tell a story of a job done not very long ago, a job, too, which was done by one of the largest firms in Canada. The specifications referring to the boiler, which was a tubular boiler, were altogether unnecessary and filled two sheets of the heat specifications with some most foolish things mentioned. Then came the mountings, which, by the way, were called trimmings, along with a full set of firing tools. It then went on to say how many pieces and what there ought to be in a full set of tools, and how long they were to be, etc., and on the whole matter referring to the boiler very little mentioned was vital. The heating was not too bad, but no particular size radiators were given, only the number of square feet. It was to be a one-pipe system. Several radiators had to be hung up in the basement so as to be above the waterline. Well, as I said before, nothing as to the kind of radiators was mentioned. This basement had a ceiling 12 ft. high, and the building was an ideal one for an ideal job of piping. The firm that put it in could not possibly have made any money on that job. There were at least 10 per cent. too many fittings, and that meant a lot more labor in putting them in. Now, if I told you, reader, there was a distance of 4 ft. from a given point on the steam main to the water line in the boiler would you think it necessary to use 38 in. 2-loop radiators, and then drop down with a wet return? Which

was going to be in the way? Well, there they are. Now some of these radiators are hung up and some are resting on big heavy bracks; regular 28 x 38 in. radiators, with feet on; and a sight they look, perched up there. If I were working for a boss who asked me to put up a job like that I'd walk out.

Then, coming back to the boiler. First, there were nearly 4,000 ft. radiation, and the boiler had a half galvanized iron supply, branched into a return, and no check valve on either and no blow off anywhere. Then the damper-regulator was a size just about large enough for a boiler of about 400 ft. radiation. It was supplied with steam from above the water line with 1/2 in. pipe and no trap on it to save the steam from destroying the diaphragm washer, with the result that every month or so a new washer has to be put into the thing. Then, again, this regulator is hitched up with so many elbows that, when it operates, the thing falls over; and not long ago the lever stuck and the whole thing collapsed.

There is no doubt it is a very poor job. It just looks like a job where the firm who figured on it gave their figures at so much a foot of radiation, including boiler, etc., all complete, and then went in to do the job. Here was a job with architect's specifications, but no plans of the piping. And, by the way, no supply house butted in with plans here, or there would have been less fittings on the job. Now to come back to the figuring on such a job. First, plans of the building were submitted, and here was the chance for skill being shown. If some tissue paper had been placed over them and a pipe line drawn, showing place for boiler, then the number of branches marked off, then the next floor, and quantities of radiators, with area of heat required, etc.; then size marked on mains and piping for risers, etc., all would have been as easy as falling off a log, if the method were followed up a few times. But unless this way is cultivated, it will always be a hardship. The writer tried about every way possible until it was no use. Sometimes a job came out with lots of margin for profit. But it was gambling, and gambling is not honest either to the customer or the man doing the job. This job I refer to is going to be a sore point while it exists, and a source of expense to the owner as well.

New Sanitary and Heating Goods

THE NEW HONEYWELL MODEL EIGHT AUTOMATIC THERMOSTAT.

The new Honeywell model eight automatic thermostat is the result of an idea conceived by M. C. Honeywell to provide an eight-day movement, so that the thermostat would only require attention once each week, and then only

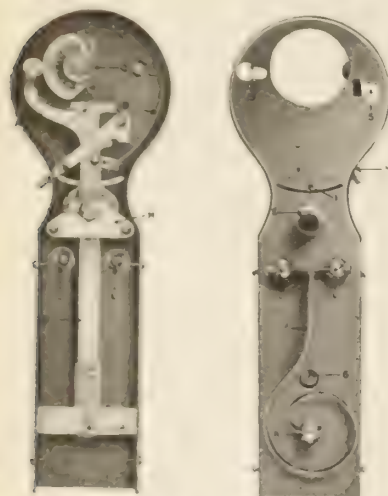


Fig. 1.—A Three-Quarter View of the Thermostat with Wall Plate Removed, but Showing Clock and Lever Arrangement. Fig. 2.—The Back View of the Thermostat with Clock Removed, Showing Lever and Shaft Arrangement with the Thermostat Element.

to wind the clock. Following out this idea, after a few months' experimenting the new model eight automatic thermostat was designed and tested out to the maker's satisfaction.

Fig. 1 shows a three-quarter view of the new instrument. It is small, symmetrically designed and neat in appearance. It is fitted with an attractive and guaranteed dependable clock. The dial is 2 1/4 inches in diameter and is of white porcelain. The clock is wound from the front. The sash, or crystal, can be easily and quickly removed for winding, adjusting or setting, by simply pulling out a spring at the bottom, which permits the sash to be lifted from the dial thus eliminating necessity of removing clock from thermostat for winding.

The clock is securely fastened to the thermostat base by means of two oval-headed pins T. T., Fig. 4, that engage in opening S. S., Fig. 3, in the base of the thermostat. A slight movement upward and to the left will quickly detach the clock, and as simple a movement will easily attach it, and yet, when in position, is as securely fastened as if held by screws. The movement is com-

pletely housed in a dust-proof case. A shaft only projects from the case at the rear, on which is fastened, by means of a compression thumb nut, a set of cams and an indicator G, Fig. 4. The shaft on which these cams are fastened is so geared that it makes one revolution in twenty-four hours and travels in a fixed relation with the hour hand.

Fig. 2 shows the back view of the thermostat with the wall plate, Fig. 6, removed, but with the clock and cams in position. A is a lever, pinioned at P, and having a roller fitted to its upper end. This roller is held firmly against the cams Q on the clock shaft by means of the spring B. At C, in lever A, is a pin that engages in a slot in the upper end of the lever D. This lever extends to the bottom of the thermostat, dividing around pin P and keyed to shaft R that passes through the thermostat base to the front and supports the thermostat element F, Fig. 3.

As the cams revolve the lever A is caused to move first one way, then the other, as the roller follows the contour of the cams. Through the pin C this movement is communicated to the lever D, which in turn shifts the thermostatic blade F (to the right warmer, to the left cooler). Therefore, it will be seen that when the roller at the top of the lever A is in contact with the high sides of the cams Q, the position of the lever will be farthest from the cam centre, which throws the thermostatic blade F to the right, or warmer side, which is for the day temperature. Also that when the cams revolve so that the roller makes contact with their lower sides, the position of the lever A is nearest the cam centre, which causes the thermostat blade to pass to the left, or cooler side, which is for the night temperature.

Fig. 5 shows the cams G G removed from the shaft. One is the A.M., or opening cam, and the other the P.M., or closing cam. These cams may be so set on the shaft that at any time between noon and midnight the thermostat, it is said, will noiselessly set back to any desired lower temperature, and at any time during the twelve hours of the following morning will quietly set up again to 70 degrees normal. The closing cam is so shaped that when set for closing the drafts cannot open after the closing hour until the temperature of the room or building in which the thermostat is located falls to the predetermined low temperature (it may be as much as 15 degrees below normal), af-

ter which and during the low temperature period (which in the case cited above would be from 10 p.m. to 7 a.m., or nine hours), the thermostat will keep the room or building at the said predetermined low temperature until an hour or two before the full opening or arising that the drafts begin to open from one and one-half to two hours before the full opening period, therefore, slowly increasing the fire by gradual damper control until room temperature reaches normal, which will be at about the time of the full opening hour, whatever it may be. By means of the stop H, Figs. 2 and 3, the range or throw of the lever A can be controlled so that any night temperature may be maintained. By moving the stop H up or down, the range or movement of the



Fig. 1.—A Three-Quarter View of the New Honeywell Model Eight Automatic Thermostat.

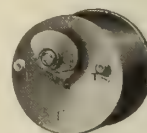


Fig. 4.—The Indicator on a set of Cams.



Fig. 5.—The Cams Removed from the Shaft.



Fig. 6.—The Wall Plate

lever A will be shortened or lengthened, thus regulating the night temperature to any degree desired between 70 and 55 degrees, or by stop H, the lever can be held off the cams entirely, therefore causing the thermostat to operate independently of the clock.

The new model Honeywell is very easy to connect. A wall plate, Fig. 6, is provided. This plate is insulated and to it is fastened the binding post at the back at NN and O. The plate is screwed to the wall, and if the cable containing wires is to be exposed, it can pass out at the bottom, and if concealed through a hole in the wall at the back of the plate. When the latter has been securely fastened to the wall the thermostat is slipped over the plate and pressed down in position, the fingers

KKKK, Fig. 6, hooking under plates M and U, Fig. 2, which brings the heads of the contact screw post LL over and against the brushes projecting from NN, thus completing the electrical connections with the thermostat and fastening it securely to the wall.

The blade is one continuous piece of laminated steel of the highest quality and of the greatest sensitiveness and fully guaranteed to retain its shape under all weather conditions. The thermostat base is made in one piece and stamped from No. 16 gauge sheet brass. The case is made of one piece of seamless drawn brass and fitted with an accurate mercury thermometer. The thermostat is furnished with the Honeywell regular pattern silent operating motor and all other parts necessary to install.



ARRANGES EXTENSION OF LEAD BOUNTY.

Regulations have been approved by order-in-Council, based on the Act of last session, which extends until 1918, or until the available sum of \$600,000 is expended, the bounty on lead from ores mined in Canada. The bounty was established in 1903, an appropriation of \$2,500,000 being made for the purpose, of which amount about \$900,000 had been expended up to June 30, 1913.

The bounty is based on the price of lead, decreasing as the price goes up, the payments ceasing when the price of lead on the London market reaches £18 per ton.



COOLING COIL IN REFRIGERATOR.

Editor, Sanitary Engineer,—Is there not some way that I can fix an ice box so that it can be sufficiently cooled without using ice? If so, please publish.—Ice Shy.

In figure 2 we publish a very successful manner that has been tried out and found perfectly satisfactory. The water comes from a deep artesian well, and is always very cold and keeps the refrigerator sufficiently cool for all everyday use. Of course, it is not as cold as ice, but it keeps the contents of the box from spoiling. The water is run into the street sewer, as it is clean, and could do no harm. This, of course, would require constant pumping.—Editor.

IMPERIAL RADIATORS.

Steel and Radiation, Ltd., Toronto and Montreal, have issued an eight-page illustrated booklet showing and describing their line of new Imperial radiators. Lists, capacities and dimensions are also given.

Shop Notes

Expansion of Water to Steam.

When water has been turned into atmospheric steam, the water has been expanded 1,728 times in volume. Hence one cubic inch of water is required to produce one cubic foot of atmospheric steam.

When the temperature of water is raised from 40 degrees Fahrenheit to boiling point. Its cubic volume is increased 5 per cent.

Carbonic acid gas CO₂ liquefies when compressed to 300 lbs. per square inch.

• • •

Tin the Hole in Boiler Tubes.

Considerable trouble is often caused by the water being drawn out of the range boiler by syphonage. The reason is, either no hole was drilled in the top of the boiler tube, or it has become rusted up. This can easily be remedied by tinning the hole in the tube after drilling it, thus preventing it from rusting up.

• • •

When Are Fitting or Screwed Joints Tight.

The man on the job is often seen exerting himself in a very unnecessary manner, when tightening a pipe into a fitting or a fitting on a pipe. Keep one hand on the fitting and when it is beginning to feel warm you can rest assured it will be a tight joint providing of course that the threads were reasonably good ones.

• • •

Making a Good Caulked Lead Joint.

When making caulked lead joints on a soil pipe, never pour all the lead at once, but pour about half, seeing of course that the molten lead has run all round and flowed together. Wait till cool; then caulk. Next pour the rest till full to the top of hub. Then caulk again. This method will never fail, for the simple reason that twice the amount of lead has been expanded by the twice caulking than if poured and caulked over, and there is less strain from caulking put on the hubs.

• • •

Lead Wool.

No sanitary engineer's shop is complete without a quantity of lead wool. This is very useful when a joint has to be caulked where there is dampness of any kind. It can be used under any condition, and also when in an awkward corner. It just needs twisting into a rope, and caulking in just as oakum is caulked in. It can be used to make a joint under water.

NEW SOCIETY FORMED.

A meeting of the Ontario Society of Heating and Ventilating Engineers took place on July 30th, when the following officers were appointed:

Honorary Member—Professor C. H. Wright, University of Toronto, architectural department.

Mr. George Huey, President.

Mr. M. F. Thomas, Vice-President.

Mr. R. B. Mackinnon, Treasurer.

Mr. Norman A. Hill, Secretary.

The following is a list of charter members:

Mr. R. B. Mackinnon, of Pease Foundry Co., Ltd.

Mr. M. F. Thomas, of James McAlear, 43 Scott Street.

Mr. Norman A. Hill, manager Industrial Buildings, Ltd.

Mr. A. S. Leitch, Sheldon's, Ltd.

Mr. E. Q. Cole, Williams & Cole.

Mr. George Huey, Canadian Domestic Engineering Co., Ltd.

Mr. Holt Gurney, Gurney Foundry Co., Ltd.

Mr. E. Schofield, Pease Foundry Co., Ltd.

Mr. W. P. Crawford, A. B. Ormsby Co., Ltd.

Mr. R. L. Smallwood, Canadian Buffalo Forge Co.

Mr. E. P. Flanagan, C. A. Dunham Co., Ltd.

Mr. C. B. Richardson, Keith's, Ltd.

Mr. A. J. Dickey, C. A. Dunham Co.,

Mr. H. H. Angus, Canadian Domestic Engineering Co., Ltd.

Mr. C. M. Sparling, Bennett & Wright's, Ltd.

Mr. R. T. Waterman, H. G. Waterman & Co.

Mr. C. T. Morse, Canadian Sirrocco Co.

Mr. Wm. Mansell, Purdy, Mansell Co.

Mr. R. F. McHenry, W. J. McGuire Co., Ltd.

Mr. Richard Dawson, Darling Bros.

Mr. C. F. Doughty, Board of Education, Toronto.

Mr. A. E. Freeman, consulting engineer, Manning Chambers.

Mr. R. E. Winn, General Manufacturers' Agency, Ltd.

Mr. F. C. Dairs, engineer, General Fire Extinguisher Co.

Its Aims and Objects.

Its aims and objects shall be the promotion of the arts and sciences of heating and ventilating in all branches.

The maintenance of a high professional standard among its members; the reading, discussion and publication of professional papers, which are calculated to advance the sciences of heating and ventilating, and the interchange of experience among members.

Head offices will be situated in the City of Toronto.

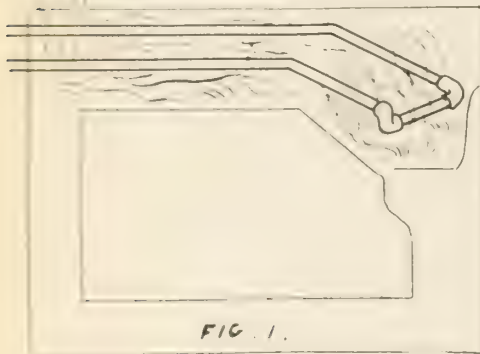
Setting and Connecting Range Boilers

By PHOENIX

In some of the preceding chapters of this series that have been published there have been shown many of the regular connections, fronts, etc., etc.

As any one knows, who has been at the business for a reasonable length of time, there arise many conditions where a workman is obliged to use his powers of invention. One trouble with the craft, in general, is that they do not cultivate this inventive power as fully as might be desired. When a man can get out of a mighty tight corner, it proves that he has mastered the principle and that he is possessed of a determined spirit. Previously, it was stated that there were some occasions where it was desirable to use a coil in a stove instead of a waterback. Such as, for instance, an old stove and a very stingy or poor customer.

Now, in previous instance I had occasion to draw some coils and a fellow



sent in a cut which is here reproduced in Figure 1. He wrote that this pipe water back was put into an old four-hole cook stove just as shown and that it heated the water in a good size range boiler much quicker than any job that he had installed for a long time. You will observe that it is put in very differently than the pipe coils that are made up for this purpose. The arrangement is very ingenious and I do not see why it should not do as the originator claims. One idea in regard to these pipe coils for range boilers is wrong. Many plumbers have installed a coil recommending that it would not stop up from lime, etc., as quickly as a waterback. Some have occasionally gone to the trouble of having a coil made of copper under the belief that it would not stop up. Now this is all dead wrong for a pipe coil (in my experience, at least) whether made from

pipe, or from copper will stop up just as quickly as a waterback. In some cases I have known of the coil stopped up the quicker. The point to look after in this respect is to remove from the water the substances that deposit on the inside of the pipes, or waterback. This can be done by using a patented water softener and it works in all of the instances that I have observed.

Figure 2 is a sketch of a job that a man once sent in to me desiring to know what the matter was. He stated that the pipe coil was connected up to a 100 gallon range boiler and that the water hardly ever got more than luke warm. Undoubtedly the heating surface on the coil was too small for the amount of water that there was. The water came, for a short time, hot; but one can easily see that the connections are so made that the faucet would pull directly from the coil, and after the little water in it and perhaps in the other pipes, there would be not much coming as the amount desired was generally large.

Besides, on the job, the coil would stand a good chance to siphon if the hole in the cold water pipe inside the boiler ever got stopped up. This coil, also, you will observe, is somewhat different than the general run. Pipe A is straight Pipe E is longer than the usual turn at that point and from F there are two "crooks." It seems to me, however, that this range boiler stands rather low, with regard to the position of the heating coil. Other than the foregoing, it might pass. Now figure out where you are at and see just how good a job this man had.

I have known many workmen never hesitate to connect up a 100 gallon range boiler to the ordinary size of waterback on the ordinary heating range, and I have never yet known of a case that was not a failure.

I do not say that it has not been successfully done, but it has been my experience that the ordinary waterback will not swing, successfully, a range boiler of the size mentioned. It works far better on range boilers of from 30 to 60 gallons in size. One can so install a job and if he has sense enough to put it in properly it should heat the water in the range boiler thoroughly. As to how quickly the hot water comes from the

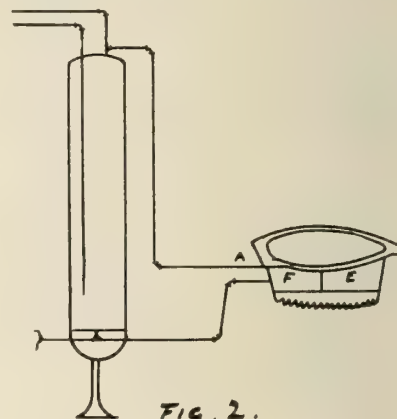
faucet, that is quite another matter and depends upon the manner in which the piping is arranged, as has been shown in this series some time previously.

In case an amount of hot water is desired that would be more than an ordinary range boiler could possibly furnish, it is quite useless puzzling one's brains with attempting to contrive some way to beat old Dame Nature. Why not use good common sense and put in a storage tank and an independent heater. Such a plant will give much more satisfaction and be a standing advertisement to the good for the shop and the man who put it in.

(To be continued)

RANGE CLOSETS.

Editor, Sanitary Engineer,—Would you advise installing a series of range



closets in a small factory where the owner wants to be up-to-date?—S. J. Robinson.

We should advise you to take the owner on a visit to some first-class factories and note the fixtures and the conditions. He will thus be able to judge for himself as to what he sees, and whatever decision he comes to, you will be free from any consideration in the matter of selection as to the class of fixtures. Of course, in either case it will be well for the interests of all that you advise the best fixtures, and not have installed a cheap line, which would only bring on annoyance and loss later on. Factory fixtures are subjected to severe usage and must be good.—Editor.



The Question Box



Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

INSTALLING CLEANOUTS.

Editor, Sanitary Engineer,—Just where is it necessary to put cleanouts on a plumbing job?—Apprentice.

Speaking generally, it may be said that all traps with the exception of the closet should be so provided. There is hardly anything that can be done that will add more to the value of the job than to install a good system of cleanouts in an intelligent and practical manner. The extra cash that the customer so invests will, in the course of time, pay for itself many times over.—Editor.

VALVING WATER SUPPLY PIPES.

Editor, Sanitary Engineer,—Do you think that it would be a good plan to valve the hot and cold water pipes supplying the wash basins, urinals, etc., in a large factory? It would mean a considerable added expense, but if you can mention any cases of the kind you know of, I believe that I could convince the owner.—Plumber.

In a factory we should consider it a very wise provision that would enable a workman to repair any certain fixture without laying out the whole battery, or perhaps the whole system. Some of the largest manufactories in Canada and the United States have taken this precaution and believe this method is good practice. The time saved, even if a plumber has to be called in, will soon pay for a few valves.—Editor.

AIR IN THE ROOM WAS TOO DRY.

Editor, Sanitary Engineer,—All last winter the air in the steam heated rooms in a customer's house was too dry, and he complained to me many times. Now is there some way that I can fix it so that he will be satisfied?—Troubles.

There are firms who make regular pans that fit the radiator, and into the pans a sufficient quantity of water can be placed to introduce moisture into the air of the rooms. We suggest that you look over some of the catalogues that you must have of radiator companies, and then make your customer an

estimate for the job. Further, one or two direct-indirect radiators would answer the purpose providing a ventilator or two were placed at the ceiling of some of the rooms.—Editor.

LOCATION OF THE REGISTER.

Editor, Sanitary Engineer,—Will you please state in the Questions and Answers just where you consider the best place to locate the register of the indirect radiator? The floor, the baseboard or medium high up in the wall?—Fitter.

Probably the most common place is in the floor, but we can not say that we consider it the best. Quite a few heating engineers have advocated and installed the register at a point six or eight feet from the floor. This generally gives a down draft on the head which, to most people, is very disagreeable, and such installations have not always met with the most favorable comment. While there are always some drafts along the floor, our feet are generally warmly encased, besides being accustomed to drafts, and, therefore, it seems to us that, taking all the various points into consideration, the best place to put this register is in the baseboard. There should be some means of drawing off the foul air from the room, and as heated air rises. In that case a register should be located near the top of the room.—Editor.

METER DELIVERS HOW MUCH WATER?

Editor, Sanitary Engineer,—Will you tell me how much water will pass through a meter in any given space of time?—Apprentice.

Meters for water are made in different sizes up to six-inch pipe. Now it would depend upon the size of the meter you had reference to. A meter that is made for a one-inch pipe will deliver about 60 gallons of water per minute.—Editor.

WASTING WATER.

Editor, Sanitary Engineer,—Can you give me any suggestion as to how to

instruct my customers how to save water? We are rather short on our town supply, and any ideas will be fully appreciated.—John Dean.

First impress upon the customer's mind that he should have you stop all leaks. Then show the customer the art of mixing hot and cold water. The average person just opens up the hot water faucet and allows the hot water to come to the bath, lavatory or sink, and then cools it down with cold water. This manner of proceeding always wastes several quarts and sometimes gallons of water. It also has the effect of spoiling the walls of the bathroom if they are kalsomined. Show the customer how to draw both hot and cold water at the same time and adjust to the proper temperature. Sell the customer a double faucet, perhaps. Just one case of wasting water don't amount to much, but 1,000 or 10,000 cases becomes a very serious matter to cope with by those in charge of our water supply.—Editor.

SIZE OF RESTAURANT SINK WASTE.

Editor, Sanitary Engineer,—Will you kindly state in your next issue of Sanitary Engineer if you consider the ordinary waste to a sink large enough for a restaurant waste where they do a pretty big business?—Country Plumber.

As we are able to gather from your question we should not. Such a waste, to do the work properly, we believe should be not less than 2 inches in size, and the ordinary waste is not so large. If you have the regular size on and the waste frequently stops up, we recommend that you make this change in sizes, and also, if possible, get the customer to have you instal a grease trap.—Editor.

MAKING THE WATER TASTE GOOD.

Editor, Sanitary Engineer.—The water we use is so full of dirt that we have to filter it and frequently to boil it so as to be sure that all the impurities are done away with. Now, after the

water is boiled it has a very flat taste. Do you know of any manner in which this flat taste can be done away with without spoiling the results that have been accomplished?—A. J. Hopkins.

Get a large glass bottle, fill it about half full of the boiled water and shake the bottled water for a few moments in the bottle without having any cork in the bottle. The foregoing treatment will remove the flat taste from the water. Another method of water purification which is a very good one was published in our July 1st issue of Sanitary Engineer on page 29.—Editor.



HUMAN EFFICIENCY.

Speaking to the employes of a large manufacturing firm, the vice-president had this to say about each individual's efficiency which every clerk should read:—

"So much for the mechanical side, that is the machine and the factory. We have another problem on our minds, a few of us, to further the ability and improve the human machine as we had about machinery. It will probably take longer than eight years but I am sure that in five years from now, we are going to show a development along the line of human efficiency, efficiency of the human machine itself, even greater than we have done with the factory machine.

Too much efficiency is lost in waste in operating both the mechanical and human machine. The by-products lost in the coke industry alone are sufficient to maintain a large navy. If the efficiency of our railroads could be brought up to where it should be, their service would be more than doubled. Take the new type of locomotive, supposed to be the finest type in the world, the kind that makes a thrill run up your back when you are in the station and see it pulling in and makes you marvel at the wonder of it. Out of the coal and energy that goes into that engine we get less than 10 per cent.

"The world outside in mechanical and commercial lines is looking at the waste and an improvement is going on all the time.

"The last fifty years was given to the improvement of machinery. The next fifty years must be given to the human machine."



Winnipeg, Man.—A. E. Hanna, manager of the Steel Co. of Canada branch here, left last week for Kinnebrink Beach, Maine, to recuperate after an illness of six months. He was accompanied by Mrs. and Miss Hanna.

Plumbing and Heating Markets

Toronto, July 31.—Tightness of money seems to be holding back the building trade to a certain extent but the supply houses have been very busy so far, although at the present moment there is an apparent lull.

Soil Pipe.

Manufacturers of soil pipe are rushed and have little or no stock on hand. There is a little more activity expected and in all probability the price of soil pipe will advance as buildings reach a more completed stage.

Enamelled Ware.—Factories are satisfied with the results as a whole and while not as busy as usual for this season of the year they feel it also is on account of tightness of money and backward state of building construction.

Lead Pipe.

Lead is firm, with fairly good demands, it has taken a rise of 5% on last quotations and supply houses are making large shipments even at the advanced prices. There is every indication of a still further advance.

Lead Traps.

This is in good demand, prices are reported as having a strong tendency for substantial raise. Demands are fair and with lead at present prices and still on the rise, it is only natural that lead traps will take a rise also.

Iron Pipe, Black and Galvanized.

Tsis is in good demand, prices are unchanged, but with the usual increase demands made as buildings become nearer completion, there is every reason to expect an advance.

Copper.—There is an expectation that an advance is in sight on account of labor disturbances in the Copper Mines of Michigan. Demands are firm and steady.

Tin has remained unchanged since last quotation. A steady demand is the rule. No very large shipments are being made, but in the aggregate no let up is felt.

Brass Goods.—Factories are working full time and are not able to hold stocks up to any great amount. There is a steady demand.

Rather an increased call for better and heavier goods is the rule.

MONTREAL.

Montreal, July 30.—Montreal jobbers report a good brisk business in all lines. Slacking off in building activity has to a great extent curtailed demand but even yet they are in many cases fully a month behind with their orders and with lines

such as soil pipe can scarcely guarantee delivery even within that time.

Though tightness of money is very evidently having its effect and tending to prolong the term of construction or even defer commencement of construction of some buildings, still the manufacturing and jobbing trade make no complaints, and in some cases claim they have not yet felt any effect from it.

Lead Pipe Advances.

Following greater firmness in lead markets during the past two weeks, discounts on lead pipe and lead waste were last week changed to 5% instead of 10% as formerly. And strange as it may seem traps and bends were this week dropped to 40% off list.

Soil Pipe.

Ever since the first of the year scarcity in soil pipe has been more or less marked. Some stocks were held by jobbers from which to draw, but these have become quite exhausted, and now with factories working overtime, and a good brisk demand manufacturers begin to predict an early advance.

Iron Pipe.

Demand for iron pipe is fair, but in anticipation of a heavy demand as soon as season for installing heating systems begin, and with iron market holding steady, prices are being firmly maintained. Jobbers advise early booking for such lines as are most commonly used, and thus most likely to run short.

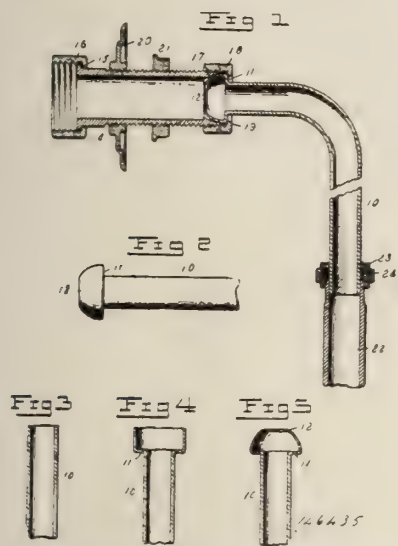
Plates and Sheets.

A much stronger feeling is now prevailing in plates and sheets than was the case two weeks ago. During the past few days a number of orders have been rushed in by big buyers indicating an expected movement upwards in price.

Metals.

Healthier in every way is the feeling which has been prevailing for the past week or two in the metal market. Tin declined two weeks ago to \$47, but has since been firming steadily. Copper is very much firmer, and now that a strike is on in the Lake copper mines, Michigan, prices are likely to advance owing to uncertainty as to supplies. On copper sheets, some mills refuse to quote a price, being doubtful as to whether supplies could be obtained. Should present conditions hold, market would be altogether likely to advance. For the past two weeks iron has been holding at about the same level on primary sources but during the last few days has shown much greater firmness though with no change as yet. Week ago spelter declined 25c per ton to \$6.75. Market is now holding firm at this level.

New Canadian Patents



No. 146,435. Pipe for Lavatories.
Tuyau de lavoirs

Gabriel W. McCoolle, St. Louis, Missouri, U.S.A., 25th March, 1913; 6 years. Filed 12th February, 1913. Receipt No. 220,376.

Claim.—1. A hose nozzle comprising a tubular body provided with a constricted portion terminating in a truncated cone-shaped flaring nozzle head, and a hollow conical-shaped spreader member forming an annular wedge-shaped passage intermediate the walls of said spreader member and nozzle head, and provided with a perforated rim portion extending across the terminating portion of said passage, said perforated rim portion being provided with an internally threaded portion threaded upon said flaring nozzle head.

2. A hose nozzle comprising a constricted tubular body terminating in an enlarged truncated cone-shaped nozzle, having wedge-shaped annular passage intermediate the walls of said deflector member and said nozzle head and terminating in a perforated internally threaded rim portion extending across the terminating portion of said annular passage and threaded upon said externally threaded base of said nozzle head.

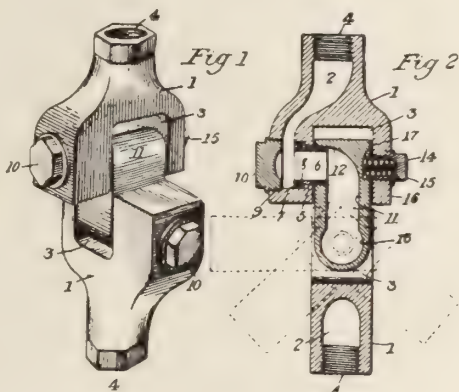
3. A hose nozzle comprising a constricted tubular body terminating in a flaring nozzle head, and a conical-shaped spreader member extending therein and forming conjointly with said nozzle head an annular wedge-shaped passage terminating in a series of perforations about the more enlarged portion of said nozzle head.

Matthew Henderson, Toronto, Ontario, Canada, 25th March, 1913; 6 years. Filed 2nd January, 1912. Receipt No. 218,628.

Claim.—1. In a pressure regulator, the combination with the body thereof having the usual outlet and inlet and central chamber, the auxiliary valve and main valve piston and a duct extending from above the auxiliary valve to below the main valve piston, and means for rendering the joint between the auxiliary valve and regulator body steam tight, as and for the purpose specified.

2. In a pressure regulator, the combination with the usual body and auxiliary valve, of means for rendering the joint between the auxiliary valve and regulator casing steam tight, as and for the purpose specified.

3. In a pressure regulator, the combination with the usual regulator body and auxiliary valve, of an annular shoulder, a flange extending from the auxiliary valve to bear upon the ad-



No. 146,836. Joint for Pipes.

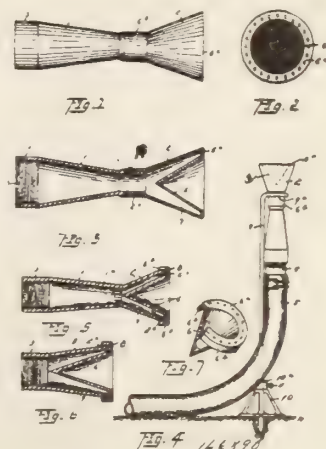
adjacent portion of the regulator body when the auxiliary valve is in place, as and for the purpose specified.

The H. Mueller Manufacturing Company, assignee of Anton C. Schuermann, both of Decatur, Illinois, U.S.A., 11th March, 1913; 6 years. Filed 6th November, 1912. Receipt No. 216,481.

Claim.—1. As a new article of manufacture, a supply pipe adapted for connection at its opposite ends respectively with a faucet shank and a service pipe, said supply pipe comprising a drawn metal tube, having a portion thereof near one end projected laterally in all directions to provide an annular shoulder,

der, the metal of the tube in advance of and adjacent said shoulder being convex in longitudinal section and tapering from the perimeter of the shoulder to the extremity of the tube to provide an annular seat engaging wall, the mean diameter of which is greater than that of the tube, and the width of which is relatively broad as compared to the extent to which the annular shoulder projects beyond the surface of the tube, whereby said flaring convex wall may make facial contact with an outwardly flaring sealing wall formed as an extension of the passage through an associated shank member, and the opposite end of said tube being smooth whereby a slip joint connection of greater or less penetration may be made with a service pipe.

2. In a coupling for water and other pipes, a supply pipe composed of a drawn metal tube having a portion thereof near one end projected laterally in all directions to provide an annular shoulder, the metal of the tube in advance of and adjacent the shoulder being convex in longitudinal section and tapering from the perimeter of the shoulder toward the extremity of the tube to provide an annular seat engaging wall, the mean diameter of which is greater than that of the tube and the width of which is relatively broad as compared to the extent to which the shoulder projects beyond the surface of the tube, the opposite end of said tube being smooth in combination with a pair of pipe connections, one of which connections has an outwardly flaring internal seat formed as an extension of the passage therethrough and into which the extremity of the tube pro-



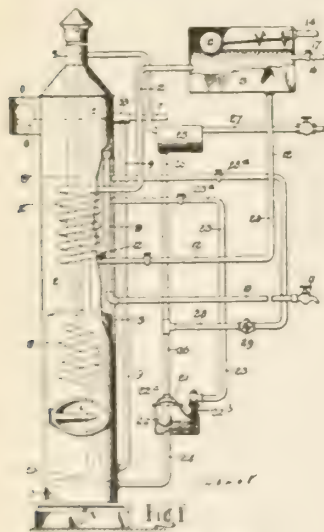
No. 146,890. Hose Nozzle.

jects and against which the outer face of the convex wall in advance of the said shoulder makes contact, and into the other of which connections the smooth end of the supply pipe is free to telescope to a greater or less depth, and coupling nuts for coupling the supply pipe at its opposite ends respectively to the said pipe connections.

Hot Water or Steam Supplying Apparatus.

W. B. D. Ponninghaus, South Yarra, Bourke, Victoria, and John A. Wallace, Wanganella, Townsend, New South Wales, assignee of a half interest both in Australia, 11th March, 1913; 6 years. Filed 28th August, 1912. Receipt No. 213,804.

Claim.—1. Improvements in and connected with apparatus for the supply of hot water or steam, consisting in the combination of a shell having a fire box, a steam generator within and forming part of said fire box, upper and lower fire bars for use with said fire box, and a water feed device in communication



No. 146,468.

with the shell and the steam generator and capable of being thrown out of active operation and into communication with an independent water supply, as and for the purpose specified.

2. In a water heater for the supply of hot water or steam, the combination with a shell having therein a fire box, of a steam generator within said fire box, and having a hot water chamber at the bottom thereof, upstanding side tubes in communication with said chamber, cross tubes uniting the side tubes, a centre tube communicating with the cross tubes and a delivery pipe, and an automatic feeding device in communication with the steam delivery pipe, the shell of the heater and the hot water chamber, as and for the

3. Improvements in and connected with apparatus for the supply of hot water or steam, consisting in a shell having an automatic supply of cold water thereto, a fire box within said shell, and having a flue passing upwardly therethrough, hot water coils encircling said flue, a steam generator within the fire box, and having a hot water chamber at the bottom thereof, an automatic feeding device in communication with the shell and with the steam generator, means to close the communication between the shell and said feeding device, an independent water supply in communication with said feed device, means to close the communication between the independent supply and said feeding device, and means to render the feed device inactive, as and for the purpose specified,

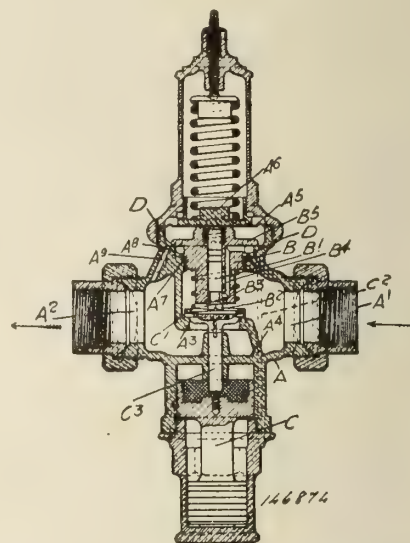
4. Improvements in and connected with apparatus for the supply of hot water or steam, consisting in a shell having therein a fire box, a flue passing from said fire box upwardly through said shell, a hot water coil encircling said flue, a circulating coil encircling said flue, a supply pipe adjacent said shell, a feed device communicating with the supply pipe and the shell, a float within the shell controlling the communication between the supply and feed pipes, a generator within the fire box and a hot water chamber and upstanding pipes, upper and lower fire bars for use with said fire box, a feed cistern in communication with the hot water chamber and the pipes of the generator, a valve controlled relief pipe in communication with the feed cistern and the shell, a tap upon said relief pipe, a cistern water supply pipe communicating with the feed cistern and the shell, a tap upon said supply pipe, a valve within said feed cistern controlling said supply pipe, a device for controlling said valve by hand, a float within the feed cistern and controlling the valve thereof, a water branch pipe communicating with the cistern supply pipe between the tap and the valve thereof, and a tap upon said branch pipe, as and for the purpose specified.

George Rudolph Augustine, Tacoma, Washington, U.S.A., 25th March, 1913; 6 years. Filed 22nd January, 1913. Receipt No. 219,478.

Claim.—1. A flexible joint, having a head provided with two hollow portions, a sleeve arranged in a counter-bored outlet hole in one of said hollow portions, and having a flange adapted to be seated by pressure against the shoulder of said counter-bored hole, and a gasket interposed between said flange and arranged to turn in the other hollow portion, a spring bearing against the side of the connecting link opposite its con-

nection with the sleeve and a cup nut threaded in the outer wall of the link receiving hollow portion and sustaining the spring so that said spring will tend to ease the pressure of the flange of the sleeve on its seat and thus minimize wear.

2. A flexible joint, having a head provided with two hollow portions, a sleeve arranged to turn in a counter-bored outlet hole in one of said hollow portions, and having a flange adapted to be seated by pressure against the shoulder of said counter-bored hole, and a gasket interposed between said flange and



No. 146,874. Pressure Regulator.

shoulder, a hollow link attached to said sleeve and arranged in the other hollow portion, a spring bearing against the side of the connecting link opposite its connection with the sleeve and acting to ease the pressure of the flange of said sleeve on its seat, and a cap nut threaded in the outer wall of the link receiving hollow portion and sustaining the spring, said cap nut entering a recess in the connecting link and serving as a bearing upon which the link turns.

A WISE LAD.

To make sure the youngster was not disobeying the bass fishing law, the game warden took his string of fish out of the water and found only a catfish, perch and sucker on the line. A few feet further down the stream he found a large bass wriggling on a string weighed down with a stone and asked the boy what he was doing with the fish. "Well you see," answered the boy, "he's been taking my bait all morning so I just tied him up there until I got through fishing."

Complete Course of Sheet Metal Work

By L. W. KOSER

On Plate 31 we show a problem very similar to those shown on Plates 29 and 30, viz: to go from an octagon at the bottom to a round at the top, being set off to one side of the centre.

We, however, introduce here a new feature, viz., the dotted lines.

The reason for this being that if we were to make all the lines the same there might be confusion owing to there being so many triangles, consequently we make a set of dotted lines and also make two diagrams of triangles, one for the full lines and another for the dotted ones. A perspective view of this article is shown at Fig. 1 A.

We first draw the octagon base of the plan, lettering each corner as A, B,

C, etc., the plan Fig. 1. Then locate the circle top and divide it off into 8 equal spaces, numbering each, having number 1 near A for convenience sake.

Then draw heavy lines from A to 1, B to 2, C to 3, etc.

Then draw dotted lines from 1 to B, 2 to C, 3 to D, etc.

Draw the elevation R S X Y, Fig. 2, as previously explained.

Extend the line X Y to form a base line for the diagram of triangles, and as the triangles are all the same height, extend the line R S to locate the points J and K.

Draw the line J W and K Z any convenient place, so as to allow sufficient space for the diagram of triangles.

Now at Fig. 3, develop a diagram of triangles for the full lines and at Fig. 4 a diagram of triangles for the dotted lines, observing the rule for doing so as laid down for problems 1 and 2.

Now lay out the pattern by first using the true length of the full line A 1, taken from Fig. 3 as 1 J.

Then use the dotted line 1 B, taken from Fig. 4 and the space A B of the plan for locating the point B of Fig. 5.

Then use the full line 2 B, as shown by 2 J, Fig. 3, and the space 1-2, as shown by the plan for locating the point 2 of the pattern Fig. 5.

Proceed in this manner until the pattern is developed.

31

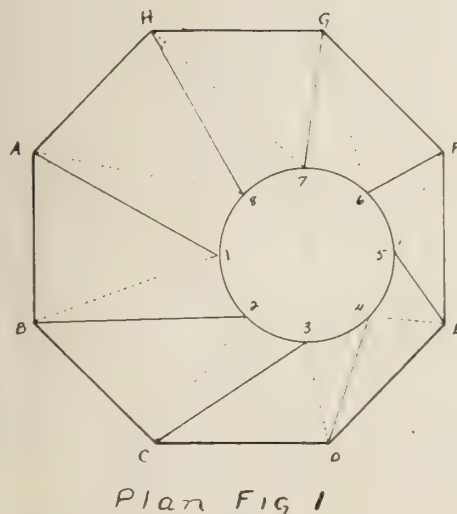
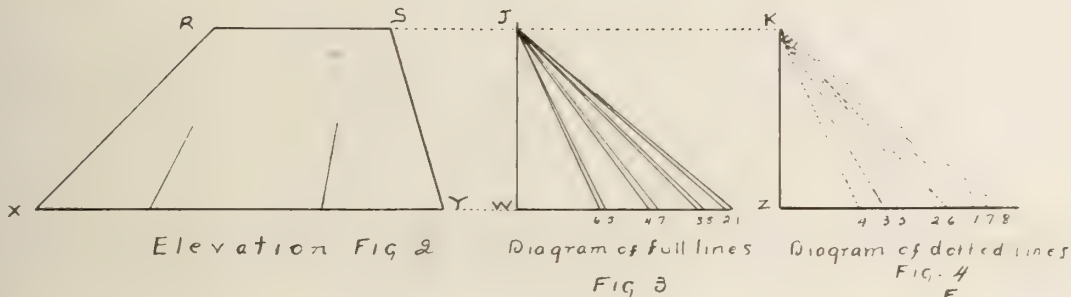
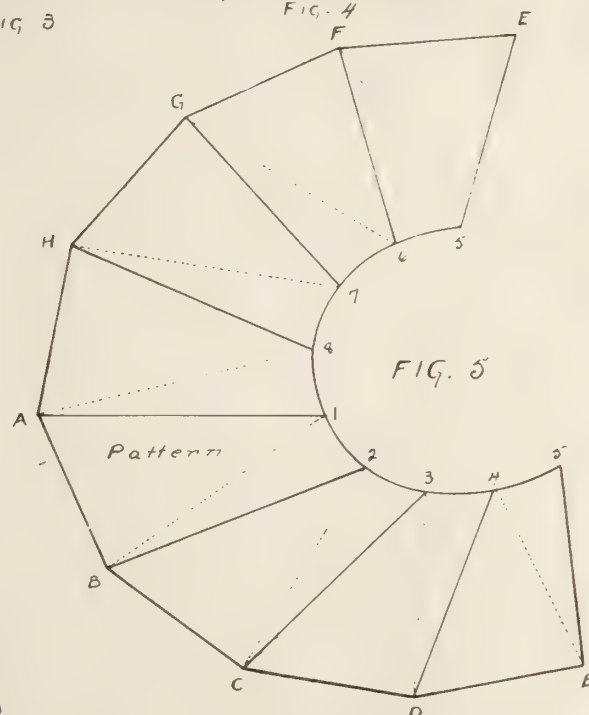


Fig. 1-A-perspective view



PROBLEM 3 TRIANGULATION



On plate 32 we show another form of transition piece a little more difficult than the previous one.

There are two features shown here not used on the previous examples, viz., the half circle at the top of the elevation and the different heights of the triangles.

The problem is to develop a transition piece having any shaped base, say either round, square, octagon or elliptical, and a top being either round or elliptical and set either over the centre or to one side BUT BEING ON AN ANGLE, i.e., not parallel to the base.

The transition piece can be any of the shapes mentioned and the process of developing the pattern would be the same but we will take for our example a transition piece having a round base and an

elliptical top set to one side of the centre and pitched to any angle say about 30 degrees a side, front and back view of this shown at Figs. 1-A, 1-B and 1-C.

Now let us first take up the explanation of the half circle or the top of the elevation.

This half circle represents the true shape and size of one-half of the elliptical top shown on the plan, Fig. 1.

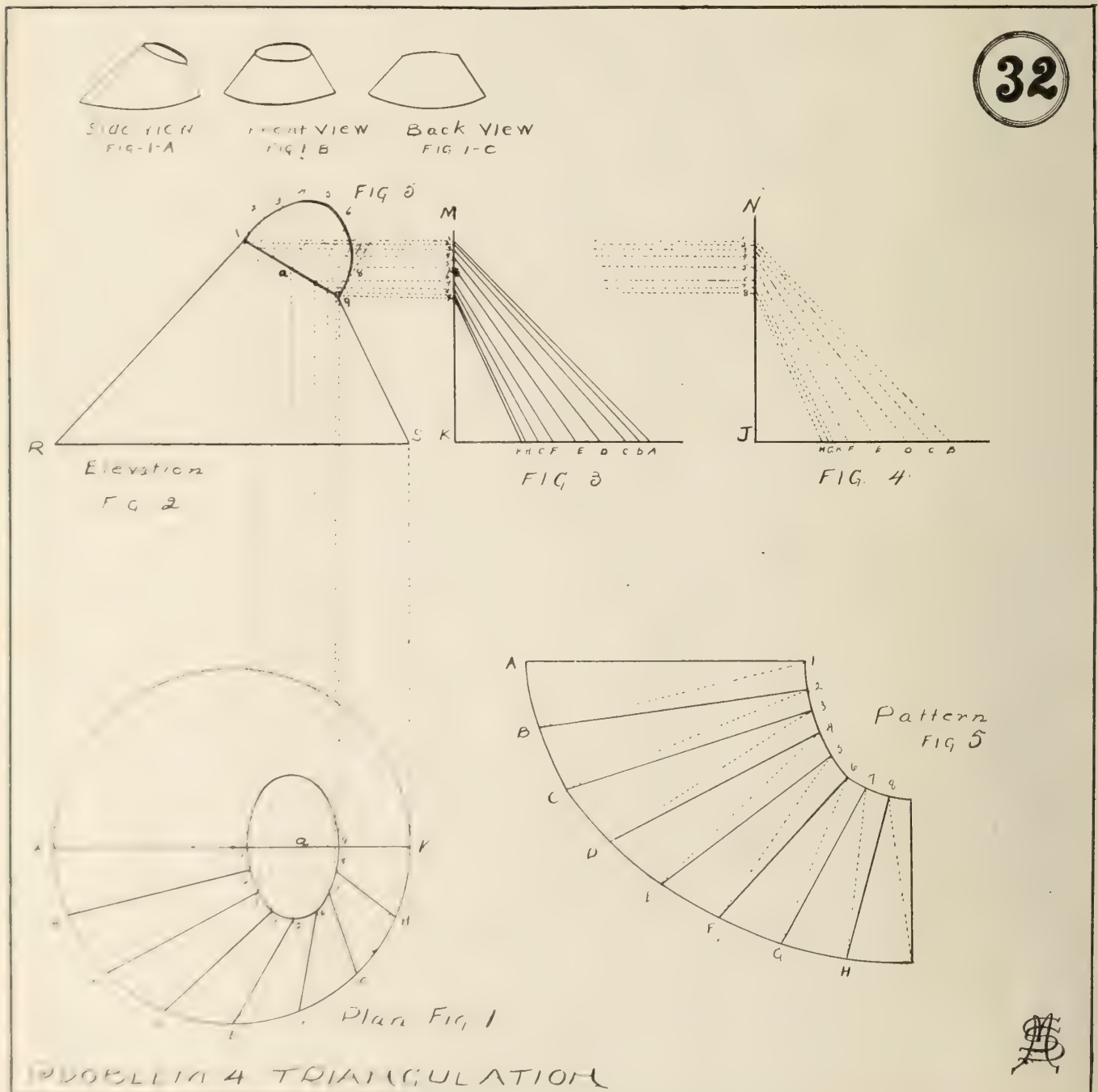
Now it will be observed that the line 1-9 of the elevation is wider than the line 1-9 of the plan representing the width of the ellipse for the reason that 1-9 of the plan shows only the plan width while 1-9 of the elevation gives the true width, consequently the true shape of the ellipse is slightly wider and bigger around than that shown on the

plan and it is necessary that we have the true shape of the ellipse before we can accurately develop our pattern.

The method of finding this will be explained as we proceed with the example.

Now in regard to the other new feature, viz., the different heights of the triangles observing the elevation, Fig. 2, it will be noticed that the height of the back represented by the line 1-R is higher and longer than the height at the front shown by 9-S consequently, the height of the sides get gradually shorter as they move to the front and the height of the triangles have a corresponding decrease. For instance, the triangle A-1 of the full lines is longer and higher than the triangle K-9, the difference being gradual throughout.

(Continued in next issue.)





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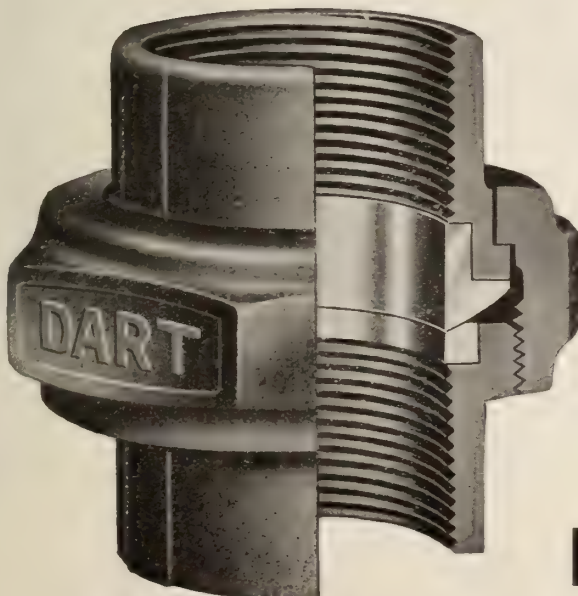
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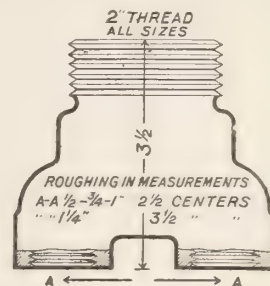
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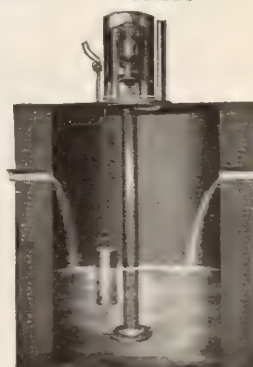
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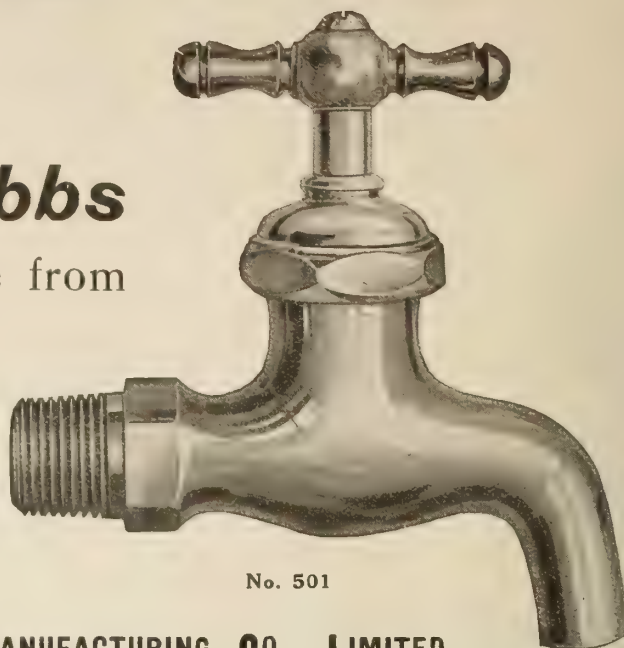
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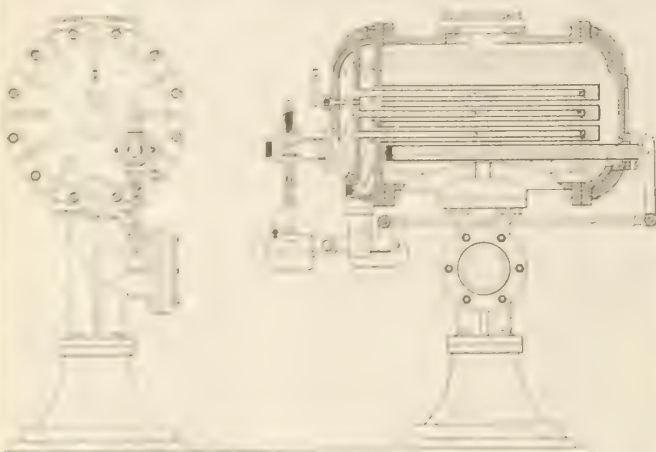
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Excellent Opportunity to Make Large Profits



This heater is a compact unit as the ordinary hot water heater. It is carried to it from a boiler house stationed at the boiler house, but reduced at every 15-10-5 lbs., or as low as 10 lbs. temperature required in the Manny Heater from the boiler room.

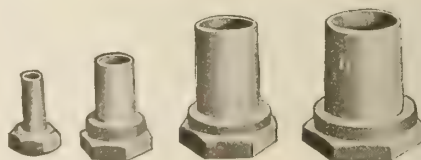
It is a compact unit as the ordinary hot water heater. It is carried to it from a boiler house stationed at the boiler house, but reduced at every 15-10-5 lbs., or as low as 10 lbs. temperature required in the Manny Heater from the boiler room.

Let us give you full particulars, regarding this newest and best heater for buildings. Write for descriptive catalog T.

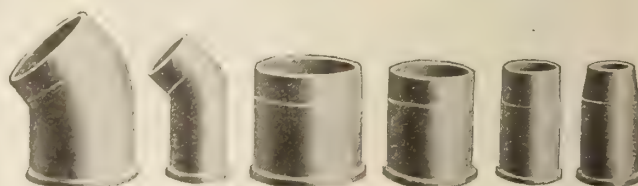
The E. S. Manny Co., Montreal



Cleanouts, Iron Body, Brass Tops



Brass Nipples, Male and Female



Brass Ferrules, Standard and Heavy

Tallman's Reputation is in the Goods

Tallman Brass & Metal Co.
HAMILTON, ONT.

**Here It Is
Mr. Plumber**



The New "Dale Ball Cock" For Low Down Tanks With Hush and Refill Tubes

(PATENTED)

The elevated "Dale" is now a reality—
Noiseless—Positive Action—Simple Construction
—Instant Adjustment—Guaranteed. Use it also, the
low down "Dale" pattern for high tanks and your Ball Cock
troubles are ended.

Ask our salesman to show you a sample of it and to quote
you prices or write us and we will quote you.

Canadian Wolverine Company, Ltd.

Chatham, -:- Ontario

Manufacturers of High Grade Plumbers' Supplies of all Kinds



This is The Radiator Valve You Have Been Waiting For

An absolutely PACKLESS valve, with no composition rubber rings or discs
in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will
not score, cut or become unevenly worn, as the spindle bearing runs the
length of the bonnet spindle cavity.

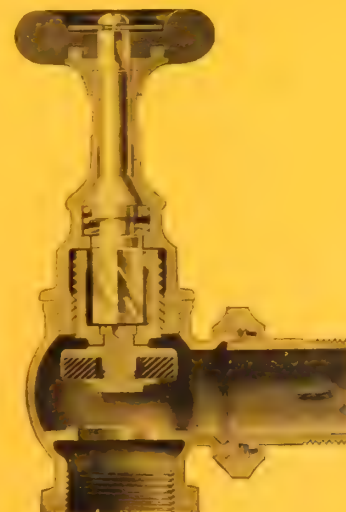
No strain on the stem or stem seat at any time
other than the tension of the phosphor non-cor-
rodable spring which holds it in its place.

All the thrust is against the threads on the disc
carrier and in the heavy bonnet. The stem
simply acts as a KEY to revolve the disc carrier.
No inexperienced person can tamper with the
working parts of this valve, as they are all

securely locked inside the valve.

Every valve tested with steam, and we guarantee them to be tight.

Give this valve a trial on the next vacuum job or high class steam heating
plant.



The Kerr Engine Company, Limited,

Valve Manufacturers,

WALKERVILLE,

ONTARIO

ARE YOU FAMILIAR
WITH THE PRODUCTS OF—

GALT BRASS CO., LIMITED
Manufacturers of
HIGH GRADE BRASS GOODS—PLUMBERS SUPPLIES
GALT :- CANADA

Representatives:

R. S. ALEXANDER	-	Residence Phone College 7418	-	TORONTO
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Why is EMPIRE Quick Pression Work the Best?



1st. Quarter turn of the handle allows full half inch waterway.

2nd. Every bibb and cock is provided with locknut allowing only quarter turn of handle.

3rd. Stem seats are of special white cotton fibre of extra wearing quality.

4th. Beauty of design and perfection of finish.

5th. Thorough test and unconditional guarantee.

Empire Manufacturing Co., Limited

Head Office and Factory, LONDON, Ont.

Montreal Office, Room 31. C. P. R. Telegraph Bldg.

Winnipeg Office, 109 Carlton Block, Portage Ave.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

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LONDON, ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VII.

Publication Office : TORONTO, AUGUST 15, 1913

No. 16



THE STANDARD

COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA



COLONIAL—PLATE F109

Porcelain Enameled Allover Lavatory on Pedestal, with Compression Combination Supply and Waste Fitting, $\frac{3}{8}$ " Supply Pipes with Stops and $1\frac{1}{4}$ " Close Connection Trap with Vent.

Ideal "COLONIAL" LAVATORY

A "Medium Priced"
High Grade Fixture

Actual Size 22" x 27"
Oval Bowl, rear outlet $11\frac{3}{4}$ " x $14\frac{3}{4}$ "
Apron $4\frac{1}{2}$ "

F109 Complete, as described—List..	\$63.00
F109 Less Fittings—List.....	30.50
Approximate Weight.....	205 lbs.

WRITE FOR CIRCULAR.

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119 KING STREET EAST

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410 CARTER COTTEN BLDG

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

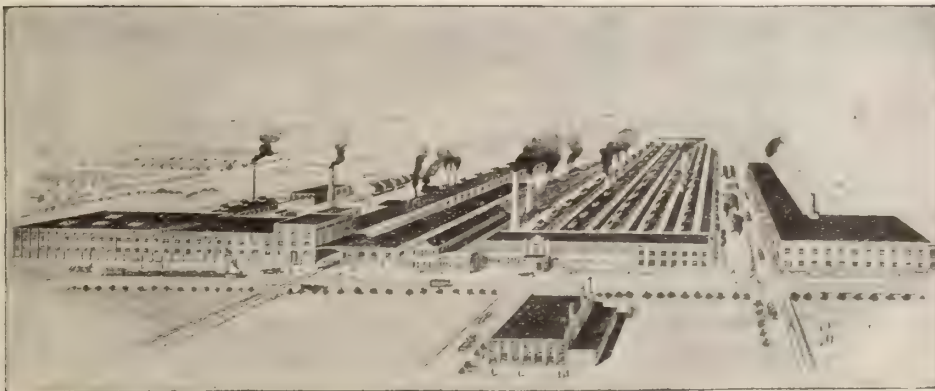
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CATALOG FURNISHED UPON REQUEST



“Standard Sanitary” Modern Bathroom



Design P—55.

This bathroom illustrates a simple, but extremely practical and beautiful interior and shows how successfully beauty and utility can be combined. The simple shower over the tiled-in bath offers the maximum of bathing facilities with the least possible equipment and display.

Lavatory is the “Standard Sanitary” “Narova” design, a pattern that has proven very popular on account of its handsome appearance and excellent quality. It is enamelled all over, free from cracks and crevices, and is easily kept immaculately clean and sanitary.

The Closet is of the Metric Flushing Valve type. Its operation is accomplished by pushing momentarily a small index button, and is guaranteed to thoroughly flush the bowl at each operation.

All Closets of this type, operating on direct pressure, should be supplied with water at a minimum pressure of ten pounds through a full 1¼-inch I.P. size supply pipe to each Closet.

“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:

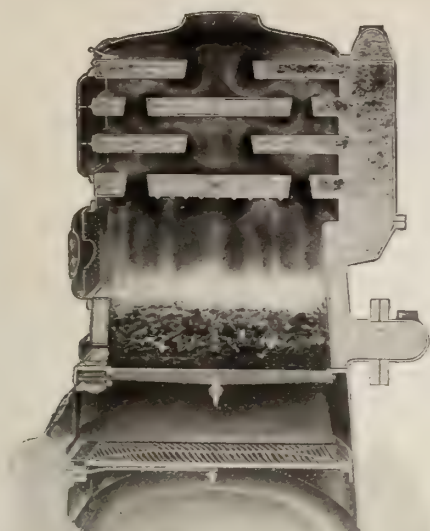
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

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Hamilton Store:

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The
“DAISY”
 Hot Water Boiler

Over 50,000
 in Use

Speaks for Itself!

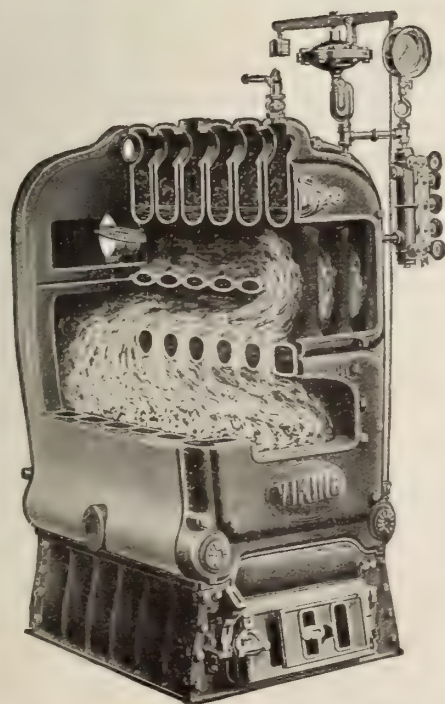


WARDEN KING LIMITED, MONTREAL
 Branch, 27 Lombard Street, TORONTO

AGENTS
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 The MECHANICS' SUPPLY CO., QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
 The WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



Our
“VIKING”
 BOILERS

For STEAM or HOT WATER

Are Giving Great
 Satisfaction

They are easily regulated
 and kept clean.



“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”



USED IN GERMANY

HONEYWELL HEAT GENERATORS are recommended and sold in Germany by the leading dealers in heating equipment.

There, hot water heating plants must pass a rigid inspection before acceptance, and sealing hot water systems is governed by law. There, as in England and other foreign countries where there is discrimination, Honeywell Heat Generators are chosen when seals are used.

Whenever an absolutely safe and dependable sealed or safety valve is required for holding a pressure of either water or air, that will relieve any excess pressure beyond that required, but positively hold the desired pressure, the Honeywell Heat Generator is specified.

Honeywell Heat Generators are built in several sizes and for various pressures and purposes.

It is the only seal that will operate for years without attention and can be installed with absolute assurance that it will continue to perform its function without the care of an engineer.

If you haven't a copy of our fitter's hand book write for one. It tells all about Honeywell hot water heating.

Honeywell Heating Specialty Company

1008 Eastern Townships Bank Building, MONTREAL

WABASH, IND.

BIRMINGHAM, ENG.

NEW YORK, N.Y.



Hot Water Quick Opening Radiator Valve.

"MILLER" Hot Water and Steam Radiator Valves

The bodies and bonnets of our Hot Water Quick Opening Radiator Valves are made in one piece, thus having a great advantage over other valves, as it leaves one less joint or possible leakage. The cone-shaped Disc prevents sticking.

Our superior Steam Radiator Valves have very low seats and a high lift of Disc.

We manufacture both valves from 1/2 in. to 2 in., with or without union, also union elbows.

Every valve is thoroughly tested and has an unlimited guarantee. They are built for service. Ask your jobber for them.

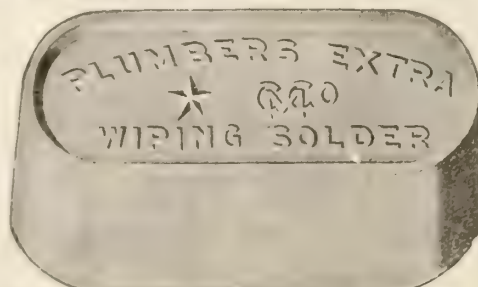


Steam Radiator Valve.

MILLER LIMITED - LONDON, CAN.

PLUMBERS' EXTRA STAR

The Highest Grade Wiping Solder. The same price as Cheap Solder. Why not use the Best?



For a First-Class Joint buy the Solder with the Tin in. Particular Plumbers Use only Extra Star Wiping.

Manufactured and Guaranteed by
Fraser Ave., TORONTO

The Canada Metal Co., Limited
MONTREAL

WINNIPEG

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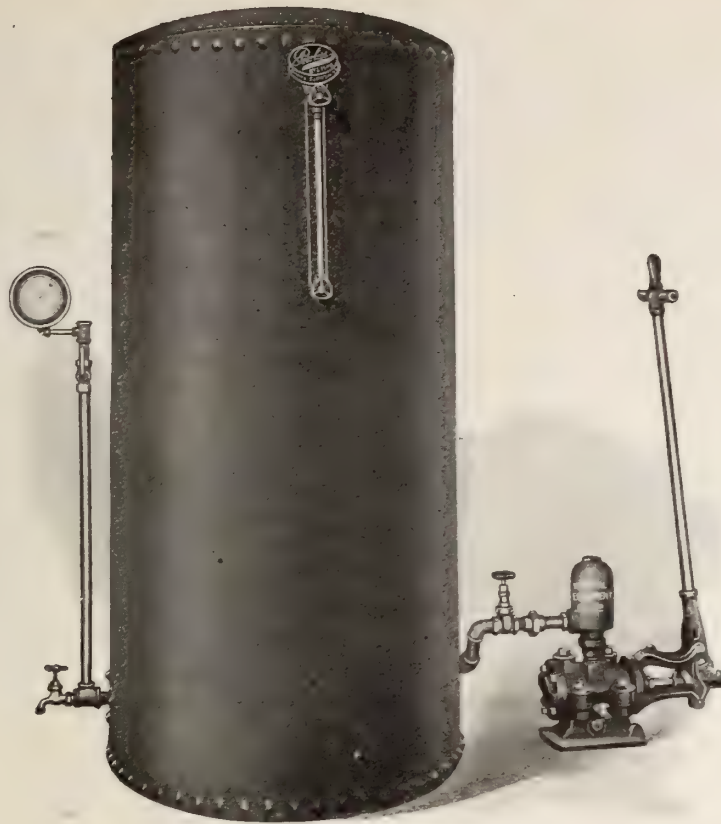


Figure No. 112 B Peerless Water System

No More Leaking Air Compressors

The air compressors on hydraulic-pneumatic pumps have always been a source of trouble. Their construction required the use of a packing gland inside the water chamber and also a check valve, both of which almost always allowed water to escape to the floor. Repairing them is a nuisance to the plumber.

Owners of these pumps also cannot be brought to realize that when pumping air the handle must be driven to the **EXTREME END OF ITS STROKE**, otherwise the air is **COMPRESSED ONLY** and **NOT EXPELLED** into the tank. **Result, a kick.**

The device above illustrated entirely overcomes these difficulties and is the most important improvement in hand-operated pneumatic systems in recent times. **By merely turning a pet cock** on a specially designed device air is delivered to the tank at any time, in any quantity, with no additional effort. **And no leak.**

Shipped to you exactly as shown—can be set up in an hour. **NEW PRICES THE LOWEST IN AMERICA.**

National Equipment Company, Limited

Sorauren Ave. and Wabash Ave.

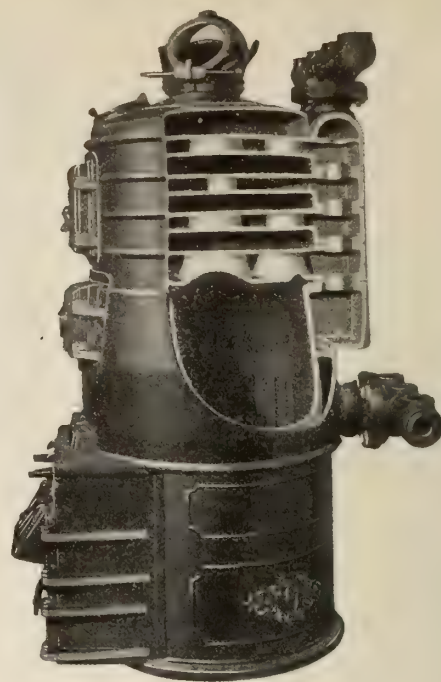
Toronto, Ontario

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"Gurney-Oxford"

The Complete
Heating Proposition



Gurney-Oxford Square boilers offer the largest range of styles and sizes—16 sizes of the water-tube type (Bright Idea); 22 sizes of the sectional type (900 Series). Absolutely the easiest boiler to erect on the market.

The largest line of tank heaters on the market—Four styles—capacity from a 50-gallon tank to a 600-gallon tank.



Gurney-Oxford Round Boilers make reputations—

You know about the Economizer, the one-lever fire controller. It saves coal, prevents gas, gives the temperature desired and makes friends for the fitter.

The bell-mouthed deep first section and the insloping walls of the fire-pot lessen loss of heat up the chimney.

The push nipple connections appeal to every practical fitter. If they are best for large cast sectional boilers, and all the makers seem to think so, then they are all right for the smaller boiler, and on the small sizes we can ship you the sections mounted—that means labor saved and a profit made.

We carry stock at Toronto, Hamilton, Montreal, Winnipeg, Calgary, Edmonton, Lethbridge, Vancouver, and it is complete,—boilers, radiators, valves, pipe, fittings; every possible sundry for the heating man.

Our new Heating Engineers' Companion is now out, did you get your copy? Whether you are a master or a fitter we will gladly send you one on request—address it to your nearest branch house.

Send your orders for the line that stands for: Largest Facilities, Greatest Variety; Best Service.

We show you by our service that we value your trade.

The Gurney Foundry Co., Ltd.

Toronto and West Toronto

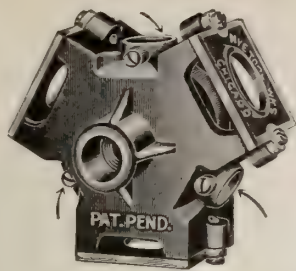
Montreal

Hamilton

Winnipeg

Vancouver

Metals Limited—Calgary, Edmonton, Lethbridge



The Nye Three Way Die Stock

This stock holds $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch solid dies, size of block $2\frac{3}{8}$ inches square. The tool is a one piece casting, containing three die boxes and three bushings, all of which are parts of the one casting.

Each die box is equally distant from the centre, thereby distributing the weight evenly. The bushings are tapped into the stock body immediately opposite each die and corresponding in size to that die. There is nothing loose about this stock that can be lost, no separate parts are necessary. The dies are locked in each box, and there remain until they are worn out. A close nipple can be cut if desired. A reducer bushing can be used, allowing the use of a $\frac{3}{8}$ inch die if desired.

Price net complete (without dies) \$2.75.

The Nye Tool & Machine Works

124 N. Jefferson St., Chicago, Ill.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, $\frac{1}{8}$ IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



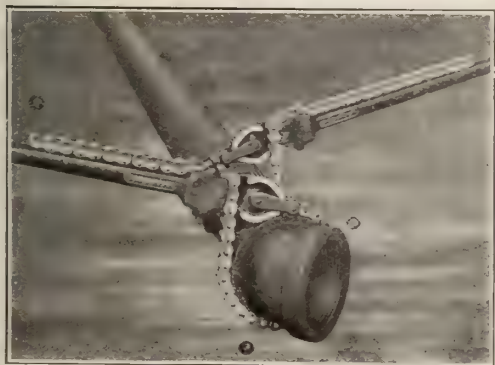
Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

ONE TOOL FOR ALL THINGS!



"Agrippa" Pipe and Fittings Wrench

The single jaw will do everything that is possible with the parallel jaw tools and more when the operation is cramped or the fittings lack in gripping surfaces.

It will grip upon surfaces where the ordinary tool "can't."

It will do work which the broader jaw tool "won't."

It will give you more and better service than can any screw-adjusted wrench made.

It will start the rusted pipe or fitting when all else fails—just the service you have a right to expect in a fully warranted tool.

The price is in your favor, too!

J. H. WILLIAMS & CO.

SUPERIOR DROP FORGED PIPE TOOLS

77 Richards Street
Brooklyn, N.Y.

40 So. Clinton Street
Chicago, Ill.

Making up a 6" 45 on the line.

Always place the chain across the jaw before locking

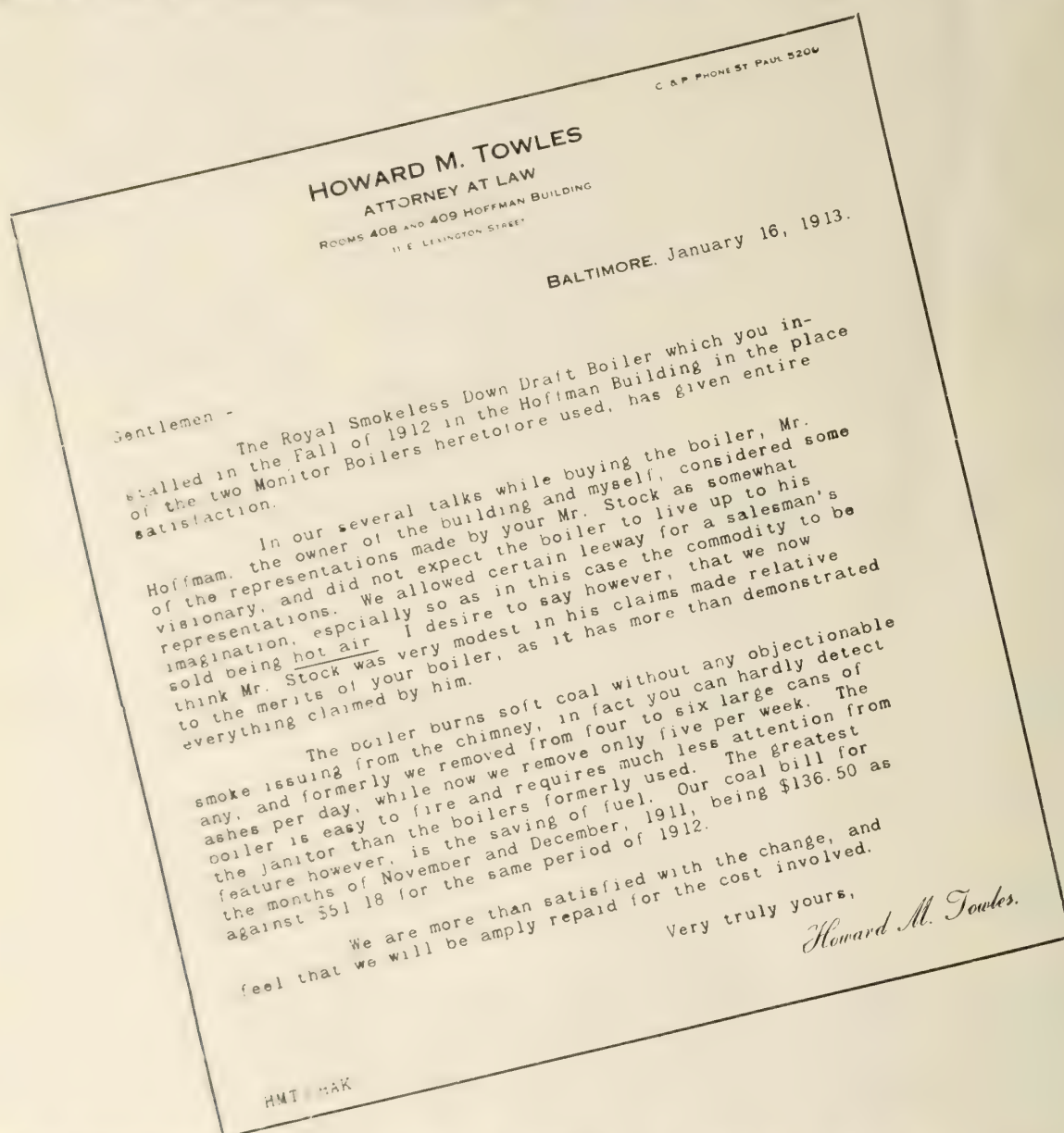
"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

We Guarantee The ROYAL SMOKELESS WATER TUBE BOILER to Save 25 to 33 $\frac{1}{3}$ per cent. of Fuel

The double grate and combustion chambers of this boiler are so arranged that 90 per cent. of smoke is consumed, thus effecting an enormous saving in fuel.

Soot cannot collect in chimneys, smoke being practically consumed. Very little soot clings to the flues of the boiler. It burns soft coal and eliminates the smoke nuisance. Requires very little attention. No brick work necessary in connection with this boiler. Not necessary to tear down a section of building to instal—the Royal can be carried down any ordinary stairway—in sections.

A 4,000 square ft. Royal Smokeless Boiler is the one used in the Hoffman Building as per following letter.



STEEL AND RADIATION, LIMITED

HEAD OFFICE, Fraser Ave., TORONTO

Branches:

138 Craig Street, West, MONTREAL
101 St. John Street, QUEBEC

Showrooms:

80 Adelaide Street East,
TORONTO

Agencies in all the leading Cities in Canada



Store of T. A. Cowan, Colborne St., Brantford, Ontario.

Remarkable Displays in Sanitary, Heating and Ventilating Engineering Establishment—The Public Can Almost Always Come to the Conclusion That Well Laid Out Stores, Clean Workshops, Up-to-Date Fixtures and Modern Tools are a Sure Indication That the Sanitary Matters Rest in Fairly Good Hands.

The City of Brantford can claim to have as fine a lot of sanitary goods, heating and lighting apparatus, vacuum cleaners, etc., to choose from as any city in Canada. One of these displays we have great pleasure in showing to our readers. While not large there certainly is a great choice of the finest goods obtainable in the establishment of T. A. Cowan, Colborne St., Brantford.

Mr. Cowan began business some 17 years ago in a very humble way, and he has proved himself a man of first-class craftsmanship. His whole heart is in his profession.

He certainly knows the business from A to Z. This establishment is sanitary too. No dust can be found in any nook or corner. All small brass goods are kept away in drawers wrapped up to keep them from tarnishing. When a customer comes in and asks for a faucet, stop cock or bath waste, he can see a clean one, just as nice as when it left the factory.

The quality too of these brass goods is of the best. Mr. Cowan feels he can sell good goods to his customers, he also stated that when he sells a good article he is sure of his customer coming back. He is creating the public feeling in no mean way to ask for the best goods. In connection with Mr. Cowan regarding price cutting. He never will lower his price to anyone. He has a splendid system which has taken a lot of time, care and earnest thought to evolve, and when a price has gone in he knows it is the lowest, compatible with a first-class installation in this system for contract work he has a nice plan of estimating with every conceivable fitting it is possible to use in an up-to-date equipment, on the back of these estimating sheets there is a blank space for the plan, if one is not submitted. There are columns for actual cash cost, of each article. Freight charges, incidentals, overhead charges and finally profit and, as Mr. Cowan has

to exist on profits he is careful that this item is guarded as it is just as necessary to his existence as the air he breathes. Most of his customers come to his establishment with the order to do their work without estimating. He having by hard work and conscientious dealing gained their confidence.

His men have a clean, tidy appearance, and all seem to have an interest in the business. One cannot say too much for the fine display and cleanliness of same. The beautiful assortment, too, is large. In this store three up-to-date bathrooms are fitted up as will be seen by one of the illustrations and Mr. Cowan has a vacuum cleaner fully equipped which he can operate right on the spot. With this machine his store is kept clean, operated by electricity with all the modern tools included, this is a branch which receives a great deal of attention and several residences are equipped with these stationary plants. It is a feature which is



Three views of T. A. Conan's store, showing bath rooms.



Beautiful assortment of electric fixtures and enamelware.

about the most sanitary as well as being a new field for the sanitary engineer.

No brooms should be allowed to be used in our homes at this date where a vacuum cleaner can be had and operated by electricity, and Mr. Cowan is convinced that no house is complete without a vacuum cleaner either portable or stationary.

Lighting is a feature which is well catered for in this store, the only trouble which is apt to be met with is that one has the opportunity of being spoilt with choice. Every fixture is kept clean and free from dust and can be lighted to show the very best effects. This department caters of course to both gas and electric fittings. There is a staff of men employed who thoroughly understand the wiring of residences or factories. Speaking of the system of bookkeeping and thorough checking up of everything. This is a business which has peculiarities all of its own.

All orders are taken down at once, either personally or from the telephone and recorded. Then an order is made out with all the particulars connected with each order. The first man in is sent to the work. Each man has a separate time book of his own, and if he is called upon to do more than one job a day the name and address of each customer is given right on the time sheet.

Before any material is handed out a requisition sheet has to be given for all goods taken away. Then a credit is given for all goods returned right on this material sheet which has to be certified before being handed into the office for final entering up. This department is in care of Mr. Henderson who is to be given credit to a great extent for the able manner in which the office work is handled. Every minute detail has been well worked out, each phase of the business is analysed thoroughly so that no leaks can take place.

By this system Mr. Henderson can tell what profit has been made on each and every job, as well as the losses. These losses, too, are recorded and while "Sanitary Engineer" would like to have gone into details and reproduced this system from start to finish, it would not be fair to give away such valuable information broadcast which has cost both Mr. Henderson, who is the business manager, so much work. Suffice to say Mr. Cowan has one of the most thriving enterprises in Canada and speaking generally Brantford has four of the finest laid out places of business which are all situated on Colborne street that could be found in the whole Dominion and a close study of these illustrations of T. A. Cowan's should certainly cause some of those engaged in the craft to follow up this good work

and by so doing create a feeling for better goods. More sanitary homes and in every sense of the word.

CORRECTION.

In our issue of August 1 a slight error was made in article entitled

Pointers on Solder and Its Uses.

The ingredients should read: 5 parts lead and 3 parts tin instead of 5 lead and 1 tin.

EDITOR.

NEW BOOKLETS.

Messrs. Cluff Brothers, 85 and 87 Church St., Toronto, have recently issued a neat little booklet entitled, "Sanitary Plumbing Fixtures."

It is a pocket edition and describes in a very creditable manner the Vitro Ware, viz., tanks, seats and tank valves and is known as Catalogue "C" 1913. Every Sanitary engineer should apply for this booklet and will receive as neat and interesting a book as could be desired.

WANTED

WANTED—SET SECOND-HAND COMBINATION dies cutting 2 in. to 4 in. pipe; also 1 in. to 2 in., and wire cutters. Art. Lawson, Strathroy, Ont. (16)

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
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Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, AUG. 15, 1913

PUBLIC SHOULD PAY FOR ADVICE AND ESTIMATES ON PROPOSED WORK.

In other columns of this issue mention is made of a topic which has been the personal opinion of a vast number of those engaged in the business of sanitary heating and ventilating engineering, and which is of very great moment to the trade.

The public have been allowed to make a regular traffic on the time of sanitary and heating engineers in the past. If anyone wanted the least work done or had some part of his plumbing or heating out of order, he would call at the places of business and relate his troubles or he would telephone for someone to go up or for a man to be sent to see the trouble. Sometimes it needed expert knowledge to diagnose the trouble, or in some cases it need different tools than was expected it would need. Simply because the party telephoning the order had not given a proper definition of the trouble.

For instance, not very long ago, the writer knew of someone phoning a sanitary engineer that a hot water pipe was leaking close to a tap, so of course the sanitary engineer, knowing it was an old house and that the hot water as well as cold was lead pipe, naturally sent a man with a kit of tools to repair a lead pipe, but on the man arriving it was found to be a hot-water pipe on a coil near the valve and belonged of course to the heating system. Not the supply system which the sanitary engineer was given to understand.

"What was the outcome, the man had to go back, get other tools and in the meantime the ceiling was being ruined. It was winter time, late in the afternoon. Overtime had to be paid for and a lot of abuse was given to the firm for sending a man without the proper tools, and by the way a thing that often happens, because the journeymen cannot carry all the tools required for every job in a house.

But if the public would use a little common sense, a little more thought, give a little more study as to what a supply pipe or a heating coil was, try and become more conversant with the piping and general make-up of the sanitary, heating and ventilating in their homes, a great deal of this ill-feeling and misunderstanding would vanish.

The people would as a whole begin to feel that a sanitary and heating engineer is a commodity of no mean order. He would be given a little more credit for what he knows. We are all apt to feel that we know more of a certain thing than we really do. The public actually know so very little of this line of business that they are apt to judge too hastily on the work of this craft.

Then again as our correspondent says in his letter to the editor: If a charge was made by those in the trade, there would be less running around with every job for a price. The situation is humorous to say the least. Suppose a man was needing some legal advice and he went to a lawyer and said: "Mr. Lawyer," I want to know how much it will cost me to make Mr. Jones do so and so. He says so and so, and I say this or that and the results is my character has been damaged and I wish to sue him for \$10,000. How much will you do the job for and guarantee me the \$10,000, and just suppose the lawyer says: "Oh, that's easy (but of course we know he wouldn't)". Well that job will cost you all of \$5,000, etc., and the man needing the advice says: "Well, Mr. Lawyer," your price is too high. I was in Lawyer Brown's office and he said he would guarantee me the verdict for \$3,000, and if you care to do it for that you can take the job.

Now that is the position of the sanitary and heating business to-day. Anyone takes the liberty to ask advice. Call for tenders from everyone without ever dreaming that any charge shall be made, but that does not alter the fact. If the matter is put before the trade at their society meetings and thoroughly voiced in a business-like manner, then a resolution passed that a minimum charge be made for advice or time taken up for work in the ordinary course. And on all estimates of work from plans of new work, a sliding scale of charges be made, then where the plans have to be furnished and estimated upon, a certain per cent. upon estimate with separate charge for plans, the people would soon see that there is nothing unreasonable.

And what is more, the very best advice would be ask for, no "curbstone plumber" would be asked for estimates or even for advice, and the public in the long-run would get a square deal all along the line. No time would be wasted and we should soon be able to see a change for the better in the trade. Price-cutting would be unheard of, and a better rating would be seen in Bradstreet & Dun's of those who are interested in the craft. There is less really rich men in this line than in any other calling. There is none so important or as responsible, and there is no trade or profession which has been so maligned as the sanitary and heating engineer for the charges he makes, yet where does the money go. It is yet to be proved where the rich are who engage in this industry.

So it is up to the sanitary, heating and ventilating engineer to practice and preach an honest policy. Honesty to one's neighbor or customer does not mean robbing oneself or vice-versa. One must be just to be generous.



MOTOR TRUCKS FOUND PROFITABLE

The Benefits Derived by the Use of Motor Trucks is Proved by Statements Made by People Who are Using These Trucks—Anyone Interested is Asked to Drop a Line to Those Users Mentioned in This Article.

The advent of the auto-truck has helped many firms to solve the perplexing problem which confronted them regarding the best means of obtaining promptness and efficiency in their delivery system. To a firm employing a large staff of men a loss of time through failure to obtain a prompt delivery of supplies is a serious question. Another loss of time is often encountered in transferring men from one job to another. With horse-drawn vehicles it is a hard proposition to make fast time, especially in a large city. By introducing the motor-truck many firms have increased the efficiency of their delivery systems in a large degree and effect a large saving in the time lost by employees. A modern auto-truck will carry a large load at a rapid rate and enables the owner to make prompt deliveries. The motorcycle is also playing a prominent part in methods of transportation, and is being used largely by foremen, who find that they can visit a large number of jobs in a very short space of time. Many firms report that they have cut down their cartage and delivery expenses a considerable amount since introducing an auto-delivery system.

The accompanying illustration shows the autos used in the cartage and delivery department of Bennett & Wright, Ltd., Toronto, Canada. This firm began business in Toronto in a small way during the year 1875. Only a few men were employed, and all the cartage work was done with horse-drawn vehicles. The business of the firm has grown rapidly, and we now find them employing upwards of three hundred men. With the

rapid expansion in business the firm realized that it would be necessary to maintain an efficient delivery system. The firm use over half a ton of caulking lead each day, and it can be readily seen that they require deliveries of large quantities of soil pipe and fittings in addition to the many other lines used in connection with their work as sanitary and heating engineers. Under the old system of delivery the firm used their own teams, and in addition they usually paid from \$10 to \$15 a day to outside cartage companies. Under this system the company suffered much inconvenience, not to speak of the large amount of the men's time lost in not being able to get prompt deliveries of supplies. This is a very serious loss, especially to firms employing a large staff of men. The room occupied by horses and vehicles also became too valuable for stabling purposes and the firm decided to launch into the motor truck method of transferring their men, material, etc., to and from the different jobs. The firm now have a large array of auto trucks, cars, and motor cycles, all of which are used in connection with the firm's business. In the illustration may be seen four motor trucks, with a carrying capacity each from $1\frac{1}{2}$ to 3 tons and an average speed full load of fifteen miles per hour. The foreman sanitary engineer has an auto which he uses in going around to the various jobs. Their heating engineer uses a motorcycle, and is enabled to visit a large number of jobs in an incredibly short space of time. The vice-president and secretary-treasurer of the company use

autos in connection with the firm's business. The president of the company also has a fine auto, which he uses largely for business purposes. The members of the firm all agree that it would be an utter impossibility to cope with the delivery problems of the firm and do the large amount of delivery so economically had they not adopted the motor truck. The T. Eaton Company, of Toronto, have now an array of trucks which are doing splendid work. Their truck superintendent when asked how they found the use of them in comparison to horse-drawn delivery wagons, said there was no comparison. This wonderful industry employs 25 motor trucks in their business, which have a carrying capacity from 6 tons down to 1,500 lbs., as follows: Two 6 tons, two 4 tons, twelve $1\frac{1}{2}$ tons, and seven 1,500 lbs., all of which are giving every satisfaction. They cannot realize how ever they were able to cope with the tremendous amount of work which these trucks seem to accomplish, when horse-drawn vehicles were the only means they employed.

The other illustration here shown is one of two 5-ton trucks which Mr. Sercombe uses in the general haulage and cartage business. Mr. Sercombe is a general contractor, and at one time kept 20 horses, viz., 10 double teams going; and, while to a certain extent he built up a very creditable business, he states, his worries and discomforts were terrible before he employed the motor truck. His work is without doubt the hardest test a truck can be put to. The procuring of steady teamsters, men who



This illustration demonstrates what a truck can carry. The load weighed nearly 5 tons.

would take care of his horses, see that their wagons were well oiled, etc., was a great source of annoyance. There is no horse-flesh to depreciate; and when a cartage contractor is working for the public he has to keep the very best cattle. These horses have to be replaced from time to time, and sold at a loss. The feed is another commodity which is becoming higher in price every day. Harness has to be kept up.

Then the room taken up for stabling such a number of horses can be well considered in a city like Toronto. Mr. Sercombe also contends that 15 per cent. of his men's time was spent in just attention to horse-flesh, whereas not 5 per

cent. is necessary with auto trucks. In fact, he is doing more business to-day with his two 5-ton trucks than he was ever able to cope with when he had ten teams on the road. There is no other problem to-day which is so vexed a question as the delivery problem, and any cartage company or business men who have a great number of deliveries to make in a day will do well to study motor truck economy. This is just a commonsense talk. But when firms such as we here mention, who are employing this mode of delivery, can give such unsolicited testimonials, it is a proof which cannot be disputed, and speaks more forcibly than all the figures one

could put forth. These three firms, too, are about the representation of the delivery business. Then, again, the motor truck has been so greatly improved that suppose a truck driver found himself a few miles away from home at, say, nearly quitting time. He cannot speed up, as in earlier days. No, every truck of any note has a set governor, which will only allow the motor to give off so much speed. Therefore, it makes the apparatus fool-proof; and in conclusion, we feel sure any who are using motor trucks will be only too pleased to give their experience to any inquirer with just as free a will as was given to "Sanitary Engineer."

Cleanliness and Order Necessary Essentials

A General Plea for Cleanliness—Some Neat Displays Seen in Several of Our Western Cities, and Some Otherwise—Some Neat Workshops and Otherwise — Neatness Brings Business.

If one interested in this sanitary and heating business, were to take a little trip around to the places of business in the different towns and cities in Canada and particularly in the western section, one could not help being impressed with the contrasts, both in the personality and general aspect of these establishments. If one finds a tasty display in one or two stores, the chances are the rest in that town will be much more so in appearance than if the rule is the opposite. In one of our cities the writer was pleased to have his attention called to one of the prettiest displays it has been his for-

tune to see and on the same street no less than four out of five were of a similar nature. In one case only out of the four was there an expensive display, which too was neat. After making inquiries as to the state of the sanitary engineering in that town it was found to be in a very fair condition. Those in the craft were on the whole a painstaking lot. Trade, while not quite as busy as could have been desired, was nothing to complain of. The financial stringency was the chief cause, rents too, in that city were not out of reason in comparison to wages paid to the workers, and

the whole city seemed to have a general neatness in appearance.

In another city visited, whilst there were a few very neat displays, there were some very untidy stores, one store not 100 feet from a main street. It too, on a busy thoroughfare, was a disgrace to the craft. It was untidy and dirty. A bath and one or two fixtures standing in the centre of the floor had the appearance of having never had a duster on them for ages. The brass goods were shop-soiled and for an establishment of a sanitary engineer the shop was a shame

(Continued on page 22.)

Back-Water Valve Needed to Prevent Floods

Their Necessity in all Localities Where Sewers Are Apt to Flood the House Drain. Authorities Should See They Are Enforced. Must be Simple in Construction.

The following address was delivered by A. G. Ware of Prince Albert at the recent convention of western sanitary engineers:

In all parts of the plumbing system, simplicity combined with safety rather than complexity is especially desirable. In a multitude of arrangement the end for which we set out may be defeated. Anything of a merely experimental nature should be excluded. The rising cost of plumbing should be taken into consideration without allowing it to seriously hamper the efficiency and safety of the plumbing system.

The first thing that strikes one in deliberating on the back water valve is its use on the plumbing system. It might be aptly termed, the safety valve. Wherever there is danger of backing up the back water valve should be placed as a preventative measure.

In many instances the great danger to the health of the occupants of premises wherever sewer flooding occurs is not sufficiently realized and consequently the thorough cleansing and disinfecting which should follow such an occurrence is neglected. Typhoid and other germs being mostly present in sewage it follows that too much care cannot be exercised. Prevention being better than cure. It is much better to prevent the cause than afterward to effect a cure, and this is where the back water or back pressure valves becomes of use. It should be placed beyond the outgo of the deep seal trap of the basement drainage, but must be placed in such a position that it in no way interferes with the free ventilation of the plumbing system.

The floor of the basement should be graded with the fall to the catch basin beneath which is situated the deep seal trap. Beyond the outgo of this trap the back pressure valve should be placed, which in the event of stoppage or over pressure in the sewer system will exclude the sewage and thus prevent flooding of the basement.

A short arm should run from the basement trap and back pressure valve connecting up to the main drain with a proper Y connection, thus ensuring that the back pressure valve does not get in the line of the vent.

The construction of the valve is of various patterns. The best type is the hinged flap of aluminum or other light

metal fitted with rubber which falls on to a good seating. This responds easily to any influence.

The covers should be screwed or bolted in order to be easily accessible. Lugged covers should be prohibited.

Another form of valve is worked on the balancing principle. An example of which we have in the room and which it appears would work very satisfactorily. It has, I understand, been in use for some years in London and with much success.

It consists of two chambers, one in which the valve works, the other in which a cork balancer is placed. (I might say the cork is coated with paint or varnish to exclude the water and so keep it as light as possible.) The valve and cork float are both connected to one rod or arm and as one rises the other falls. You will see, therefore, that when flooding occurs, water enters the chamber in which the cork float is situated through a strainer which prevents any matter entering which would be likely to hamper its working, as the cork float rises through the inrush of water, the metal valve in the opposite chamber sinks into position and closes, thus effectually preventing any fluid passing. As soon as the water is relieved and gets away the cork once more sinks and the valve again rises, opening into position. It is entirely automatic in its action, simply constructed, and worthy of notice.

The back pressure valve is a necessity in most cases where basement drainage is connected to the sanitary sewer and particularly so where sewer is laid at a less depth than 3 feet below cellar drain.

In any case its use is of importance in so much that it prevents flooding which at its best is but a nuisance.

In all cases its establishment should be encouraged and made compulsory where the sewer is laid at a less depth than 3 feet.



A New Waterworks Pump for Aylmer.

Aylmer, July 29.—Representatives of the waterworks department, including Mayor Wright, Commissioner Christi, and J. I. Millard, engineer, were in London yesterday looking over pumping machinery, etc., with a view to replacing the pump at the Caverley reservoir.

TRADE NOTES.

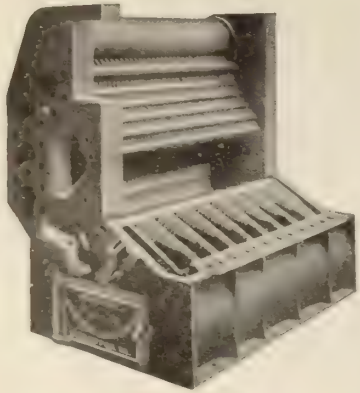
It is rather an unusual occurrence to hear of any one being "On the Rocks" at a picnic, but here is a case where a very strong trio were thoroughly "On the Rocks" at the Sanitary and Heating Engineers' picnic of Hamilton when they made themselves conspicuous at Niagara Falls. This trio in the per-



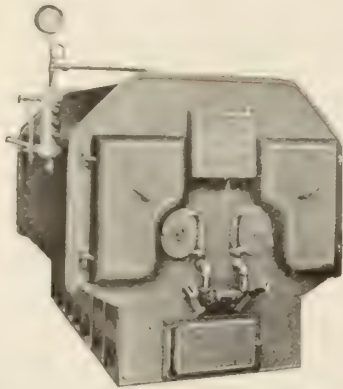
*Three men on the rocks at
Niagara Falls.*

sonnel of Good-boy Ellicott of Standard Sanitary Co., Hamilton branch, along with Messrs. McGaw and McLaren of the Galt Brass Co., Galt, would certainly make things buzz among the Hamilton boys.

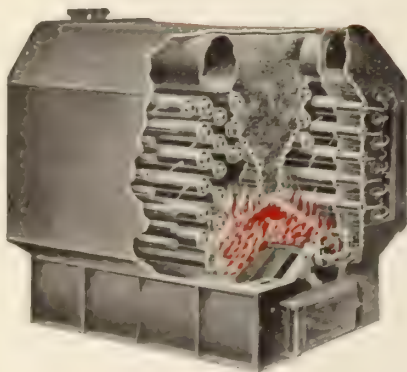
Another amusing feature which while it did not transpire at the picnic was: "The 'Sanitary Engineer' visited Hamilton on a return trip from the Western cities only to find nearly every establishment closed. It gave him the impression that the whole trade had been arrested for overcharging. After strolling round for hours from place to place, he found a card hung up announcing the picnic, which while not putting him 'On the Rocks,' convinced him that business for that day at least was 'On the Blink.'"



Showing the half section and the double grate effect of the "SPENCER" TUBULAR STEAM BOILER. Note the grate shakes freer at will.



Showing the front view of complete Boiler in the Double Grate Series "SPENCER" STEAM.



Showing arrangement of the tubes, and the double grate effect of the "SPENCER" boiler. The boiler is constructed of the best material and is the most durable and efficiently constructed boiler on the market.

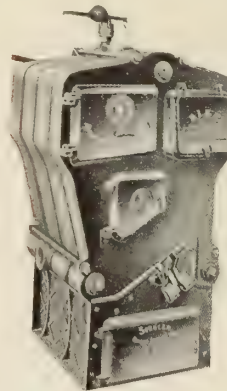
THE SA "SPENCER" Se

Have Increased Over 1000%

AND "WHY SI

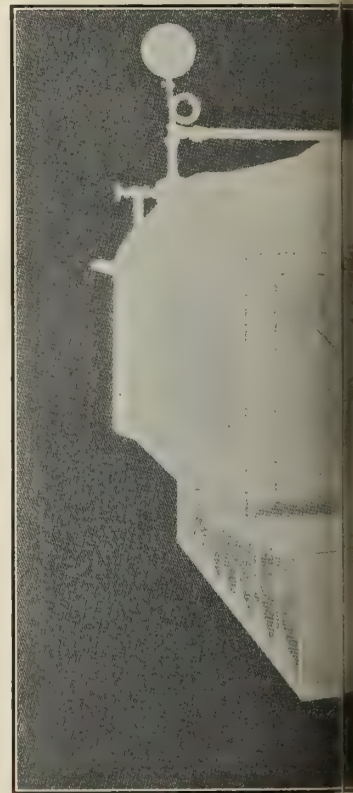
THE SPENCER WINS FOR THE HEATING CONTRACTOR
BOILER GIVES HIM BETTER RESULTS AT LESS COST
OTHER TYPE OF BOILER.

(1) The "SPENCER" is the only Boiler sold for heating purposes that will successfully burn the small, inexpensive sizes of either hard or non-coking soft coal.



Front view of the "SPENCER" WATER BOILER in the Single Grate Series.

(3) AS PROOF OF THE EFFICIENCY OF THE "SPENCER," the smoke pipe leaving the boiler when in operation is invariably cooler than the steam or water pipes. And the ashes, when removed from the base, are in a powdered condition.



PHANTOM DRAWING OF THE TUBE STEAM BOILER, ILLINOIS BOILER, WHICH HOLDS 24 HOURS

The "SPENCER" BOILER for water heating is made in sizes with capacities running from 250 square feet. The "SPENCER" STEAM BOILER is made in sizes with capacities running from 250 square feet. One-half of the "SPENCER" BOILER of the double-grate series can be operated successfully. The "SPENCER" BOILER will assuredly bring to your trade the shrewdest buyers in your district. The "SPENCERS" TALK FOR THEMSELVES, and they are the best salesmen that we have. The "SPENCER" requires no brick work, and any portion of the Boiler can be taken through a wall. IF YOU ARE INTERESTED IN THE "SPENCER" AGENCY FOR YOUR DISTRICT, WE ARE IN A POSITION TO FORWARD YOU REFERENCES FROM MANY OF THE BEST ENGINEERS AND PLUMBERS. OUR STATEMENTS IN REGARD TO THE CONSTRUCTION AND THE OPERATION OF THE BOILER. WE OFFER THE DEALER VERY SPECIAL PRICES FOR A BOILER FOR HIS OWN USE. SUPERIOR FEATURES OF THE "SPENCER" BOILERS.

WINNIPEG
92 Princess Street

WALDON COM

Canadian Distributors For PRESSED METAL
The "SPENCER" BOILERS will be a feature of the TORONTO EXHIBITION

OF THE

Feeding Boiler

ring The Last Three Years
DN'T THEY?"

GOOD WILL OF EVERY PURCHASER BECAUSE THE
FUEL AND ATTENTION THAN IS POSSIBLE OF ANY



"R" SELF-FEEDING WATER
THE MAGAZINE OF THE
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E US TO-DAY FOR FULL INFORMATION AS REGARDS PRICES, ETC.

P AND MOST SUCCESSFUL BUSINESS MEN IN CANADA, WHO WILL SUBSTANTIATE

ER" BOILERS.

ISE IN ORDER THAT HE MAY GAIN THE PERSONAL KNOWLEDGE OF THE

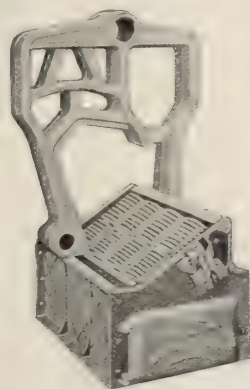
NY, LIMITED

TORONTO
Lumsden Building

ATORS, KRIEBEL VAPOR SYSTEMS

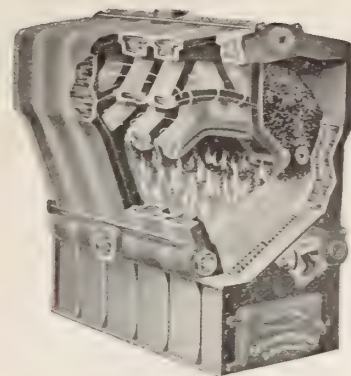
IN THIS YEAR. See our Exhibit located in the Stove Building.

(2) The "SPENCER," by reason of its Magazine Feed and Arch Grate features, maintains an even temperature on the heating system with one-quarter the attention, and using fewer tons of coal than demanded by other boilers.

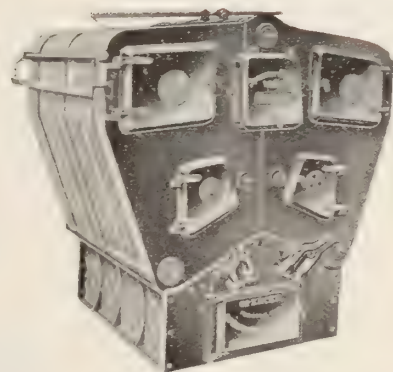


Showing the arrangement of grates and the section of the Single Grate Series Water Boiler.

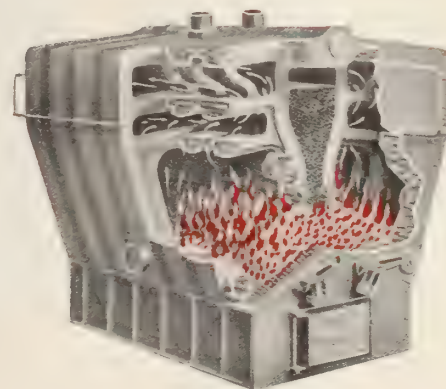
(4) EVERY "SPENCER" BOILER, EITHER FOR WATER OR STEAM, IS EQUIPPED WITH AN AUTOMATIC REGULATOR AT NO EXTRA CHARGE.



Showing the interior view of the Single Grate Series Water Boiler.



Showing the front view of the Double Grate Series "SPENCER" WATER BOILER as set up.



Showing the interior view of the Double Grate Series "SPENCER" WATER BOILER, illustrating the magazine, fire travel, and the waterways.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Subscriber's Comment on July Editorial

John Eggett, of London, Finds Something Interesting in the Editorials of Sanitary Engineer of July 15—He Makes Further Suggestions Which Should be Taken Up by Society of Domestic Sanitary and Heating Engineers.



JOHN EGGETT, LONDON.

John Eggett writes as follows:

Editor, Sanitary Engineer:—

Dear Sir:—

In reading over "Sanitary Engineer" of July 15 issue I was surprised to find you are of the same opinion regarding the time wasted by the public. The public have had too much of our time up to the present for nothing. I think it is about time we who are engaged in this sanitary and heating business should make a charge for our time. When we are called upon to inspect or give our expert opinion or advice on work or installations which are not giving satisfaction we should be paid for our time to say the least. In fact, time is not enough when we consider the value sometimes of expert advice.

I think it would be a good thing if those in the trade would take the question up at their next meeting of the Sanitary Association.

I have no doubt but that there are lots of men in the trade to-day that have had experiences such as I here beg to briefly relate.

"Some time ago I was called up on the same to go and see some work which was not giving satisfaction. I found it was a boiler in a kitchen range which was connected to an ordinary range boiler. I was told by the owner that this had been changed three times and still did not work satisfactorily. The result was,

I expressed my opinion and thinking I should be asked to make the change necessary, I showed what changes I would make. When all at once the owner saw the point of my argument and said "I believe you are right." I'll make the other fellow do it. I've already paid him and he's got to fix it."

Now I do not think we should give our ideas away to be used like that. We should let the public know right now that this thing has got to stop, and further, when called in to estimate on proposed work, I would make a suggestion something like this:

On estimates, for instance, a charge of
5 per cent. up to \$ 25.00....
 2 per cent. up to \$ 200.00
 1 per cent. up to \$1000.00
 ½ per cent. up to \$2000.00
 ¼ per cent. up to \$5000.00

Then I think the public would not peddle their work around so much, getting every one engaged in the trade to give quotations which to them cost nothing, but to us is a great loss of time and money.



Eggett & Co.'s Store, London.

I have been a subscriber and reader of "Sanitary Engineer" ever since I started in business and have always found it very interesting reading for one who has the interest of the trade at heart.

Yours truly,
 John Eggett."



Frederick G. Haslett, London.

Here is one of our future Sanitary and Heating Engineers. Fred. was very modest when speaking in a general way of how he likes the trade. He is the son of R. S. Haslett, of sanitary engineering fame in London and expressed himself as being thoroughly convinced that he would like the same trade as his father. He is a bright boy and bids fair to accomplish great things in this capacity. Mr. Haslett is the instructor of the plumbing classes at the London Technical School and comes from a family of Sanitary Engineers. His father, too, followed that line of calling. So we have in London a family of born sanitary engineers in the Haslett family, being represented by three generations.



Sanitary Association.

A convention of the Sanitary Inspectors' Association of Western Canada will be held in Winnipeg during September, according to word received from that city. This organization was recently formed at a meeting in Winnipeg, when representatives were present from nearly every large city in the West. It is probable that the headquarters for Saskatchewan will be allotted to Saskatoon. A head office will be established in each of the Western cities.



SHOP NOTES



Readers are asked to send in any Kinks they have with a view to helping the other man along. Every good thing is too good to keep.

A FREE BOOK ON FILES.

The 8th edition of the Nicholson File Company's famous book on files "File Philosophy," is just off the press, and will be sent to any applicant free by the Nicholson File Company, Port Hope, Ont.

The intention of this book is to show exactly the best ways to hold and operate files, and how to get the greatest efficiency from them. It is a useful reference book, and has been actually used as a college text book.

A filing dictionary is included, giving the technical terms for the various shapes, edges, methods of cutting, etc. This book is very valuable for shop reference. It is absolutely free and published for the benefit of all file users. Write Nicholson File Co. Port Hope.

Referring to above. We take the liberty to comment on the above. The writer has been a file user for 24 years and during his experience he has never had the opportunity of getting a book on the proper way to use a file. This is a very vital subject to one and all who use files, and there are very few who do actually know the proper way. Many a good file is spoiled, some by pure abuse in the using, others in using a file for a purpose which it was never intended, thereby practically destroying it in a few strokes. The very title of this little book proves it must be of great interest and we are sure our readers will have added a useful text book to their library by applying for one at an early date, mentioning "Sanitary Engineer." Editor.

"STUBBING" IN CEMENT FLOORS.

Every steamfitter who has ever had occasion to place the stubs for a radiator or radiators in a cement floor, such as a bath room, wash room or laundry, knows from experience that after he has placed the radiator stubs exactly where he wishes 'em to stay, when he comes to hook up the radiator that the carpenter or the cement man will knock the stubs out of the way any-

where from one to two inches unless some precaution is taken. A very good scheme is to have some short sleeves of galvanized iron. For an inch stub (in diameter) make the sleeve 2 inches in diameter. Bend a rim in the bottom so it can be nailed to the wood floor. Now wind paper solidly around the stub inside the sleeve. The cement worker will fill around the sleeve, and when the fitter comes to hook up the radiator he can remove the paper and he will have plenty of play left to wiggle the stub. Otherwise he will have to cut away cement and lose from one to two hours' valuable time.

New Plumbing Goods

NEW PIPE DIE STOCK.

The Canadian Tap and Die Company, Limited, of Galt, Ont., are manufacturing a new line of pipe die stocks. It is a double and triple die stock and can be

help realize as being a feature of a long felt want. They claim to be made of the finest tool steel it is possible to acquire and first-class workmanship, making them a very desirable tool.

These stocks take the famous LITTLE GIANT Beveled Adjustable Dies.

The workman gets one stock but three sizes of dies. Handy and convenient, they pay for themselves in a very short time.

The assortments here given are those most used and favored by steamfitters and gasfitters.

Assortment

No. 200 Cutting	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$.	Weights 4 lbs.
No. 201 Cutting	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$.	Weight 4 lbs.
No. 210 Cutting	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$.	Weight 9 lbs.
No. 211 Cutting	$\frac{1}{2}$, $\frac{3}{4}$, 1.	Weight 9 lbs.
No. 220 Cutting	$\frac{1}{2}$, $\frac{3}{4}$.	Weight 7 lbs.
No. 221 Cutting	$\frac{3}{4}$, 1.	Weight 7 lbs.
No. 230 Cutting	1, $1\frac{1}{4}$.	Weight 17 lbs.
No. 240 Cutting	$1\frac{1}{4}$, $1\frac{1}{2}$.	Weight 18 lbs.
No. 241 Cutting	$1\frac{1}{2}$, 2.	Weight 18 lbs.



BEST OF WATER AT SARNIA SOON.

The contractors in connection with the new waterworks plant being constructed at the lake, which is to cost over a quarter of a million dollars, are making fine progress. A large amount of the concrete work has already been got under way and the rest is being rushed as fast as possible. The contractors have erected a large clamshell derriek, which will be used to dig the infiltration basin. This basin will be 500 feet in length, 25 feet wide and 25 feet deep. The sides and the top are to be lined with concrete. The water will soak through the bottom from the lake and will be pumped to the town by turbine pumps operated by steam.

Engineers of the International Waterways Commission are here at present taking samples of the water from different parts of the lake and river. The American engineers are also on the job, but work with Port Huron as a base.



adjusted to cut a tight or loose-fitting thread. This is a very valuable feature and one which the pipe fitters cannot

Analysis of Canadian By-laws

"Sanitary Engineer" Will Publish a Series of Comments With Clauses Taken From the Different Canadian City By-laws, Showing Where a Uniform Code Would be Very Beneficial to the Craft Throughout Canada—Our First Mention Shall be of the By-laws in Vogue in the City of Montreal, Que., Known as By-law No. 318.

One of the chief troubles experienced by those engaged in the craft and who have learnt the trade with long years of practice and experience is the "curb-stone plumber" as he was called by one or two at a recent convention.

This class of man entering into the business and claimed by some as not being thoroughly competent to execute a piece of work properly is certainly a menace. Not only to the public but to those, who have learned the trade. In the Montreal by-law section three (3) is very emphatic and clear in the definition as to who shall and who shall not engage in the trade which reads as follows:

Section 3.—Every person who, not having obtained a license as a Master-Plumber, executes plumbing, drainage, or ventilation works in the city, shall pass an examination before the Board of Examiners, and, after having received a certificate of competency, shall register his name and address at the office of the Health Department.

Section 3 needs very little commenting upon, it is all to be desired if it is followed up by an efficient board. No man can engage in the business who is not competent. Of course we know of cities having good by-laws which are not enforced as they should be.

In section 3 mention is made of a board of examiners, and much has been said at meetings of the members engaged in the craft as to the necessity of a board of examiners so as to keep those who were not thoroughly competent from engaging to do work in this line. Now in Montreal they provide a clause in their by-law which is all to be desired. No criticism can be made as far as this matter is concerned we will reproduce Section 4 which defines the necessary qualifications of a board of examiners.

Section 4.—There shall be a board of examiners of plumbers, consisting of a building inspector or his assistant, the sanitary engineer (who shall be a member of the board ex-officio), the superintendent of the water-works, a licensed master plumber of at least 10 years' practical experience, and a plumber of at least 10 years' experience, bearer of a certificate under section 3 of this by-law. The two latter members shall be appointed by council for the term of two consecutive years and shall receive as compensation for their services a sum not ex-

ceeding five dollars per day of actual service.

The above, too, is a very good clause and one which is not embodied in several by-laws of other cities. If of course it is not carried out it may as well not be in existence, we sincerely hope that some of our Montreal members of the craft can and will enlighten us on these different subjects or clauses.

No doubt it will take a great deal of personal effort on the part of those engaged in the craft to put a lot of these laws into shape and when these efforts are being put forth one must not think of the time, etc., but rather of the results which will be accomplished by so doing. It is a world-wide matter and if each locality takes care of their own problems in matters of sanitation the time will be well spent and will also show results in no small way.

Section 5 is one which may be spoken of as a good clause and of course relates to section 4 to a great extent though it follows on to state certain examinations and tests. We will please ask our readers to look over the following section 5:

The said board of examiners shall appoint a chairman, and designate the time and place for the examination of all applicants desiring to engage in the business of plumbing within the city of Montreal. Said board shall examine said applicants as to their practical and theoretical knowledge of plumbing, house drainage, and plumbing ventilation, and shall submit the applicant to some practical test, and if satisfied of the competency of the applicant, shall so certify, and issue license, authorizing him to engage in the business of plumbing in Montreal either as a master or journeyman plumber.

Further referring to section 5. Here is a fine opportunity to institute some authority, viz. If this board of examiners would have a series of conferences and draft a set of examination papers and test questions and answers, etc. for all new applicants these could first be applied for and certain study would be applied to same by applicants before presenting themselves to this said board of examiners, this would save a lot of time and further a set time should be made, while it is mentioned as necessary, etc., we do not find any dates or times for these examinations as having been set.

Of course there are hundreds of journeymen engaged in the craft where these rules would be very embarrassing for the simple reason that they have been practically born in the trade and have not had even a common school education.

Some who cannot even write their own name decently. But in such cases as these we would certainly make liberal allowances, because in that class we have some of the very best mechanics. Yea, some who have almost forgotten more than some of our so-called plumbers know, and of course in such cases a personal verbal examination would most assuredly warrant a certificate being granted. But to young men who have no good reason why their examination papers should not be properly filled in, these should be subject to the most rigid test, and by so doing a step towards raising the standard of the craft, and one which without doubt would give results at the very commencement.

Further here is where a universal code of sanitary engineering would be found to do good work. Where if a journeyman went from one part of the Dominion to another he would be qualified to give results in each district. He would be conversant as to the general layout of a job. Of course we are aware that climatic conditions may alter matters a little, but these conditions could be taken care of by each city or district where mechanical changes had to be made on purpose to cope with those climatic conditions.

Section 11 is a good stringent clause, and if put into effect once or twice would give good results, which reads as follows:

Every licensed master plumber shall be held responsible for all the acts of his agents or employes, and any licensed plumber who neglects or refuses to comply with the provisions of this by-law, may have his license suspended or cancelled by the board of health, in which case he shall be debarred from obtaining a permit to do any work during such length of time as the said board may deem proper.

Every employer would do well by refusing to give employment to men who are not competent to carry out a piece of work to the satisfaction of the city authorities. Thereby, further serving the interest of the public.

Sections 18 and 19 have very commendable points in so much that they require that all soil pipe stacks when placed in partitions or in any way covered shall have boards over with either hinged corners or round-headed screws to enable repairs if necessary to be made or for inspection purposes, and which reads as follows:

Section 18.—The soil, drain, waste and drain ventilation pipes shall be exposed to view, ready for inspection and convenience in repairing.

Section 19.—When necessary placed within partitions or recesses of walls,

to be regretted that such is the case, and we hope in the near future to see a change so that these two cities will not be looked upon as being backward in such a vital issue.

Section 24 is just such a clause as may be found in several other city by-laws, and is all very well so far as it goes, and which requires a vent pipe to be run 5 feet above any window where said vent pipe is within 20 feet of a

ture, unless where antisiphon traps or other approved devices are used.

Of course there is another question here which is not quite clear. In no part of this by-law is there any mention made of the sizes of traps allowed, yet in this section 25, no vent less than one and one-half inches will be allowed. Then on another page the scale of weights and sizes of lead waste pipe is given and in that scale, mention is made of $1\frac{1}{4}$ inch lead waste pipe, at the same time giving weight of same.

Surely it would not mean that while vents not less than one and one-half inch would be enforced, one and one-quarter traps or waste pipes would be allowed, and in case one and one-quarter sizes of traps or waste pipe is not allowed, why was it necessary to mention the weight and size, viz., one and one-quarter inch in the scale on page 7, and mentioned under section 31.

Section 40 reads as follows:—

There shall be only one trap under the water closet as follows: "In no case shall the waste pipe from a bath tub or fixture be connected with a water-closet trap.

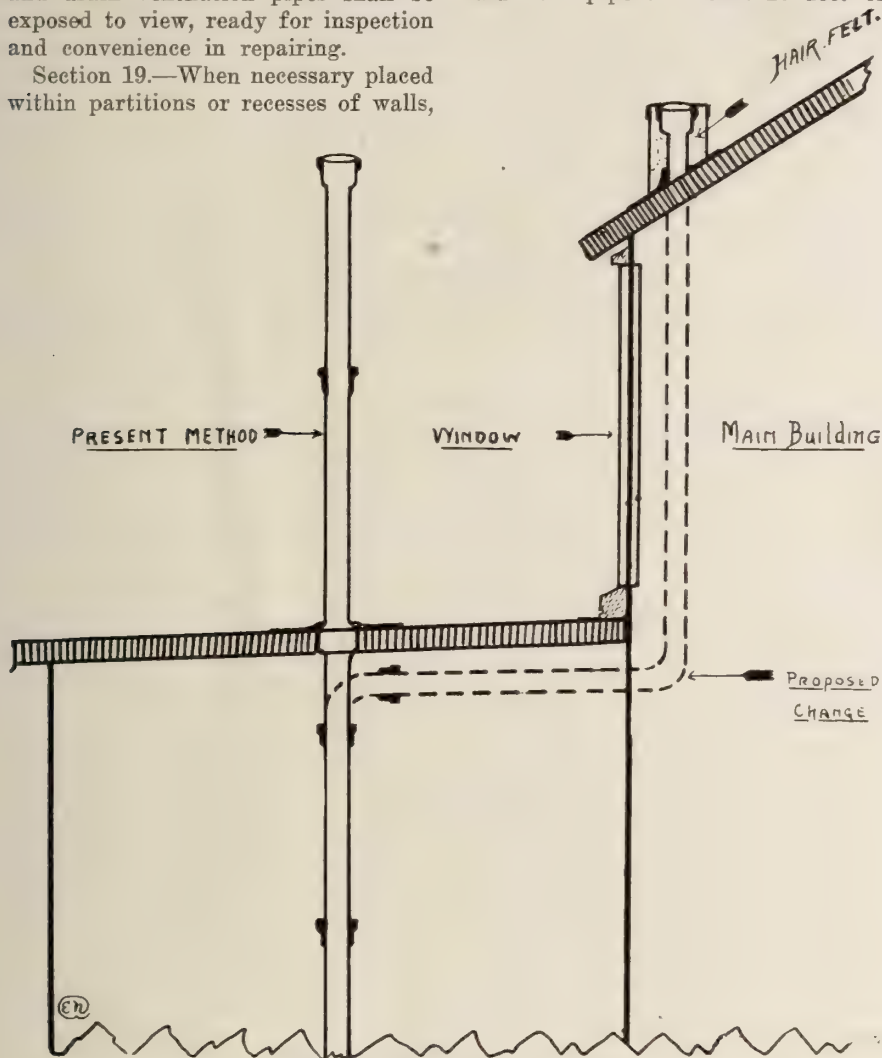
Now section 40 would lead sanitary engineers to think that a trap is actually placed under the water closet bowl and if such is the case it is very old practice and would be apt to lead one to think the water closets referred to were of the hopper style. Whereas to the best of our knowledge this style is not tolerated in any Canadian municipality. Then in Section 43 no waste pipes are allowed to be connected to said traps under water-closets.

Section 47 reads rather peculiarly, viz.:

Every water closet shall have a cistern supply, and in no case be supplied directly from the city reservoir supply pipes.

In the first part of this section it would seem to demand a separate cistern to each water closet, therefore, no patented flushometers would be allowed in the city of Montreal. We scarcely think the powers that be would intentionally take such an arbitrary stand, but would rather think what is said in the latter portion is what is wished to be understood. As by using a flushometer supply, the water closet would not be directly connected to the city supply.

As a whole we fail to see where a great deal of improvement could be made in this by-law as a general rule. If of course it is carried out. Slight changes would be beneficial where certain clauses could be made a little more definite. Any comments which are made, are with a view to create a feeling of interest by those who are engaged in the craft throughout the Dominion of Canada. The sanitary engineer's chief trouble is apathy.



soil, drain, waste or ventilation pipes shall be covered with woodwork, so fastened with hinges or round headed screws, as to be readily uncovered.

Section 22 is similar to Toronto by-law and refers to interior house drains leaving it to the will of the public at large whether tile or cast iron pipe be used, except that it requires very heavy cast iron pipe. This seems to have become a debatable point as far as one or two cities in Canada are concerned but no city on this continent which has any feeling of responsibility as to the standard of sanitary engineering will allow tile drain pipes to be used inside the walls of residences, factories or workshops, etc., which can be proved by the fact that the largest cities in the U. S. A. enforce cast iron and unless we are misinformed, the only cities in Canada who allow tile pipe inside the walls are Montreal and Toronto. It is

window. We are here making a suggestion which would make it unnecessary to have a long pipe standing up above a roof sometimes over 15 feet long. It would also act as a vent far more efficiently than having said long pipe, as the portion taken into house would be protected and warmer. We herewith show cut Fig. 1, showing what the law requires. The dotted lines show how the method would be improved in no small degree.

Section 25 has one good feature which refers to antisiphon traps or other approved devices, etc., and reads as follows:—

All traps shall be adequately protected from syphonage or air pressure, by vent pipes of a size not less than one and a half inch in diameter, and connected to the upright pipe leading to the open air, at least one inch higher than the ventilated fix-

The Cost of Steady Leaks in Fixtures

A Department Which Could be Taken Up by Making Note of Leaks in the Houses, Where Men are Sent Out to do Other Repairs, to Create a Feeling as to the Necessity of Keeping All Fixtures in Order.

The property owner pays for water waste in two ways. He pays for additions to the plant, such as new water sheds, reservoirs, tunnels, and pumping stations, rendered necessary by the waste, and he pays for the higher operating expenses caused by the increased consumption.

In New York City, for example, thanks to its prodigal water waste, taxpayers must pay \$260,000,000 for a new system of supply, and \$10,000,000 more for a tunnel to carry it from the reservoirs. When the time comes for the distribution of the new supply, new pipes must be laid in the city streets, for the old pipes will be unable to withstand the pressure. Likewise, new pipes must be laid in the buildings. And the taxpayer will see the cost of the new city mains reflected in his tax bill and will give the plumber more money for putting new pipes in his building.

If New York's water supply had been properly conserved, storage reservoirs, built at a cost of \$50,000,000 or \$60,000,000, would have furnished a sufficient supply, even though two years passed without a rainfall.

People let their faucets drip, let their pipes leak, and give no heed. They think water is as plentiful as air. They do not know that a drip 1-32 of an inch in diameter, estimated on the meter value of water at \$1 per thousand cubic feet, represents in a year the loss of \$11.68. In metered property in New York where owners have called in the services of experts to locate leakage, they have saved from one-sixth to two-thirds of their annual water bill. Hotels, restaurants and apartment houses are especially liable to this waste. The average owner or lessee ~~often has the opportunity to enable him~~ to ascertain the one or more causes that produce water waste.

In Canada we are laboring under similar difficulties. Most cities adopt the flat rate charges for water and we are having to pay large sums for larger water-works and water supply systems. What is going to be done? Who is it that should show up this terrible evil of water wasting? It is the sanitary engineer. He is directly and indirectly interested. He is to a certain extent responsible. He is the one who can point out the evils in the best light. It is up to him every time. Now in these times when the trade is not busy, there is this department of repairing leaks. The

ers that he is paying for these leaks, and paying double the amount in his taxes, that it would cost in keeping his plumbing fixtures in good order, especially if done at the right time. How many new baths or basins and sink cocks are destroyed through the small leaks being allowed to run continuously until the seats are worn out? It is the same with the ball valve on a w.c. tank. It is the duty of the sanitary engineer to point these things out according to information gathered. We find that in Toronto last year each individual used 117 gallons of water per day, or rather we should say that number of gallons per day was used in Toronto. Just imagine even half that amount nearly 60 gallons. Every one in the sanitary engineering trade knows very well that 25 per cent. would be leaks. Which means, when brought down to hard facts, that with the present supply of water, capacity, etc., Toronto could expand to another 100,000 more population without increasing the water supply. The city fathers have recently deemed it necessary to spend another million dollars to cope with the demand made upon the city waterworks for water. It is up to our sanitary engineers to look into this matter seriously. By a thorough earnest campaign, they could easily show how a lot of this water wasting could be prevented.

If sanitary engineers would become more public-spirited, the public would begin to see the good points in them. They are mostly practical men, and their version as to the method of saving water thereby lowering the constant financial expenditure both in pumping water and buying increased water works plant would be valued. There is the filtering too of this water which is wasted. It is a disgrace to think such conditions prevail in such fair cities, as we have in Canada. Just imagine how many new valves, cocks, washers and general repairs could be done for the amount of money expended in this way, which spells millions. Why the very interest on a million dollars would keep such leaks in repair.

Now let us voice our opinion to our customers along those lines and if such a course is pursued, we shall soon see results at our pumping stations. We should get right after the landlord or tenant and show him how, he would be making a good investment by engaging one in the craft to take an occasional look around his water-works end of the

sanitary engineering in his home or those of his tenants. He would be personally reducing the taxes and receiving compound interest. This increasing of our waterworks is not only a great drain on the public treasury but it is an increasing of the cost of upkeep. Try this method of increasing your business in slack times and you will become vital public benefactors.



CLEANLINESS AND ORDER NECESSARY ESSENTIALS.

(Continued from page 14.)

to be seen. What is more there is no plumbing inspector in that city, the work being done by one who fills about three or four positions. Now it is about time such matters were looked into. Those in the trade should waken up, take a pride in their calling, and remember their responsibility to the public. This man with the untidy shop cannot be making money. No customer on the face of appearances seen in this man's store would expect to get a good, sound neat job from such a man. If a man came to some of you engaged in the trade and asked for a position, you would take a good look at the man and if you found he was neat and clean and had an open countenance you would be favorably impressed, and if you were in need of a man would likely employ him. But if he was slovenly in appearance, you would never give him a thought. Another thing, when a man goes into a customer's house to do a job, and the customer happens to be there, he will watch your man, examine the tools he has. If his tool bag is clean and his tools in good order, the customer will generally have the conviction that he is going to get a good job done. It is the same with the appearance of our places of business. We should take a pride in them. If your stock of fixtures is not large, that is no reason why they should be dirty or your establishment not clean. There is many an odd half hour when your men come in. Get them to clean up and lay out what fixtures or fittings you have. There is not a trade in existence to-day that can make such a good showing as the sanitary engineers can. Let your men wipe or turn in and fit up a few panels of fittings screwed together in different forms. Fit up a range boiler with the stock size nipples and fittings.

Encourage the helpers to do odd jobs round the shop and allow them to make up a little handicraft lead work for themselves. You will be surprised how they will become interested in their job. There is nothing looks so bad as to see the boys in the shop after coming in from a job, sitting around on the benches smoking and telling the jokes they have heard, etc. They are wasting their time as well as that of the boss. The boss is only losing so many dollars and cents, but the man is losing his life piece-meal. So let all those who have an untidy workshop, clean up and keep

clean, and make a neat showing in the front shop, too. It will give your prospective customers a good impression of you. It will call the attention of the passer-by, and thereby bring you trade and a neat workshop will soon bring its results.

There are scores of fittings lying under that dirty bench. Many a piece of good pipe hidden away could be used instead of cutting a length. Use your old crates and make some shelves and racks. Get busy and you will find fittings you never knew you had and a thousand and

one things you are paying your money out for now which you don't need to do. If valves have become soiled on the shelves, get a dip made up which was given in July 15 issue, and follow out instructions. You can clean half a ton a day easily. Keep changing the layout of your front shop and such changes will prove to the passer-by that you are alive. Do it now, and stick up a few mottoes in your shop which will catch the eye. The same in your workshop. Be a live wire, not a dead end. Last, but not least, remember cleanliness is next to Godliness. Don't be so ungodly.

The Battle for Safe Water Supplies

The Nearest Source of Supply Properly Purified is Often the Best.

"In estimating the cost of obtaining safe water it is necessary to consider the following item," says Dr. Allan McLaughlin, in *Popular Mechanics*: "The cost of installation; the interest on bonded debt incurred; the sinking fund for liquidating the bonds or the depreciation fund; and the operating expenses and maintenance."

The System in Toronto.

Toronto considered several projects for an additional supply in 1912. First, an extension of the present system; source, Lake Ontario; purified by slow sand filtration. Second, Lake Ontario, water filtered by mechanical filter. Third, a pipe-line supply from Lake Simcoe. Here again the cost factor decided in favor of continuing Lake Ontario as a source of supply, but mechanical filtration was recommended instead of slow sand filtration. The pipe line to Lake Simcoe would have cost over \$10,000,000, or nearly \$9,000,000, more than the project to filter Lake Ontario water. The interest and sinking fund charges on this enormous sum would make an annual fixed capital charge of over half a million dollars. For this great outlay Lake Simcoe presented no compensating advantages.

Selecting the Method.

Small cities and towns will often be able to secure a good ground-water supply. Larger cities will usually find this type of supply inadequate, and often manufacturing towns find ground-water supplies too hard for industrial uses. If ground water is excluded for any of these reasons, the nearest good surface supply should be selected. This usually means that purification by some means is necessary. It is a measure of economy for municipal officials to employ a

good sanitary engineer to aid in selecting the source and the method of purification. His recommendation should be followed. There are many municipalities, large and small, which are satisfied with the physical characters of their water supplies, but know that the water is polluted, or exposed to sewage pollution. In such cases a hypochlorite plant, properly operated, will make the water safe at a cost of less than \$1,000 for the average installation and an operating cost of less than 50 cents for each 1,000,000 gal. treated. For purification, where there is objectionable turbidity or color in the water or if the water requires softening, mechanical filtration will be found most suitable.

Slow Sand Filtration Not Popular on This Continent.

Slow sand filtration is not gaining ground in this country because of the difficulty in handling turbid waters. The most successful plants are large installations, and even these have usually found it necessary to use preliminary filters to prepare the water for the final slow sand filters. The method is best adapted to waters which are clear and free from color.

On the other hand, mechanical filtration (rapid sand) installations are being made on every hand and in communities of all sizes, from the small village or town to cities as large as Minneapolis or Cincinnati. With the addition of hypochlorite as a finishing process, the mechanical filtration plants now constructed are almost ideal purification mechanisms from the standpoint of safe water.

Operation and Control of Plants.

After selecting the method and properly constructing the plant, the two

most important duties confronting municipal officials are securing efficient operation and proper daily bacteriological control of the plant. This depends upon the selection and employment of the right man to take charge of the plant. The best type of man for this position is a graduate in sanitary engineering. He will not only be conversant with the mechanical details of the plant, but will be able to adjust his chemicals according to the constituents and needs of the raw water. Most important of all, he will be able to make daily bacteriological examinations to determine the efficiency of purification. Nearly all the disasters due to sewage-polluted water supplies which have occurred were due to lack of daily bacteriological knowledge of the public supply or to inefficient operation of plants by unskilled men. Personally, I believe the employment of such a graduate is economy even in small cities. I can conceive, however, of cases where it is impossible for economic reasons to pay the necessary salary. In these cases local men must be employed, and trained to do the work. Here the State Board of Health, or, as in Illinois, the State Water Survey, will find a very useful function. Whenever it is possible, however, young graduates of sanitary engineering schools should be employed; and such men are well worth their salary, considering the saving in the economical adjustment of chemicals and fuel costs made possible by intelligent supervision. The greatest asset to be credited to skilled operation is the saving of human life effected, and the satisfaction of knowing that safe water is being furnished the people every day.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



TO BURN OIL FUEL.

The Editor "Sanitary Engineer."

Dear Sir, I have a steam boiler to convert to burn oil fuel. Will you please give me any information on the subject, and can the burners be made to fit the existing fire-box?—Yours,

Constant Reader.

As Constant Reader does not state what kind of fire-box he wishes to convert to burn oil fuel, we are at a loss what to advise him to do, but if he will inform us the following particulars we will only be too glad to comply and help him out of his trouble:

Amount of grate area.

Number of inches from grates to top of fire-box.

Number of square feet of radiation at present on the heating system.

Whether this radiation is likely to be increased.

What kind of oil is going to be used, and type of boiler?—Editor.

TOLEDO RATCHET DIES.

Sanitary Engineer.—Please inform me through your next issue who we can procure Toledo ratchet dies for threading pipes from 1 inch to 2 inches inclusive.—J. A. Chambers, Springfield, Ontario, Elgin County.

Messrs. Macdonald & Sons, Limited, manufacturers of steamfitters' tools, 109 Church Street, Toronto, are the sole Canadian manufacturers of the Toledo die stocks required by enquirer.—Editor.

DETERIORATION OF HEATING BOILERS.

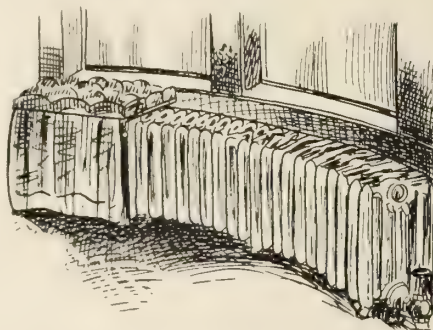
Editor, Sanitary Engineer.—Is it water, the lack of water, moisture in the air, or "what not" that puts heating boilers to the bad? I wish you'd explain in your next issue.—A Helper.

We believe that to a large extent this deterioration is due to the sulphur which is contained in the coal, more in particular if it be soft coal. The flues are not cleaned and the moisture in the air condenses, wets up the soot and forms a combination which is very harmful to the iron. It will also destroy the smoke pipe in about two seasons. This smoke pipe should be removed when the winter season is over, care-

fully cleaned and stored in some dry place. The water in the boiler should be drawn off and the boiler (steam) filled full. The water in a hot water plant should be entirely changed when the heating season is done, also before starting it up again in the fall.—Editor.

CAN I CURVE A COIL?

Editor, Sanitary Engineer.—In putting heat into a room where there is a curved window can I make a pipe coil



and curve it so it will look mechanical? If not, would you use a radiator?—C. E. Jacobis.

You can bend the pipes, but we doubt very much if you would get the various bent pipes to uniformly line up. We have seen a machine for bending pipe that would do the job and give uniformity, but the carriage shop don't have that particular machine. We believe your best resource would be to make use of a curved radiator similar to the one shown in Figure 3. You can get the radius of the window from the carpenter or architect and send it, with your order, to the manufacturer of the radiators, and you will receive a radiator that will fit.—Editor.

SAFELY SETTING HEAVY BOILERS.

Editor, Sanitary Engineer.—The other day we had occasion to set up an unusually heavy steam boiler with some ten horizontal sections. When we got it "cinched up" we found that the front of the sections did not match up with the front of the base into an inch and a half. Now, will you be kind enough to tell me the easiest way to go

about setting up one of these heavy boilers?—E. J. Buell.

In Figure 2 we show a part of the operation. If your base front and front section failed to line up, you must have set up the back section first. This is wrong. The cut shows setting (and bracing) the front section first. Then you pull all the other sections up to the first section, wedging each section as it is cinched up. If you attempt to cinch the whole bunch at one operation, you are very liable to crack some section, and besides they will not all then make up the same (or nearly so) distance. Cinching separately and using wedges, you can compel them to make up nearly alike.—Editor.

GUARDING AGAINST A WET ASHPIT.

Editor, Sanitary Engineer.—In a couple of weeks I have to set a boiler in very damp cellar. I shall have to have a deep ashpit, and am afraid that when

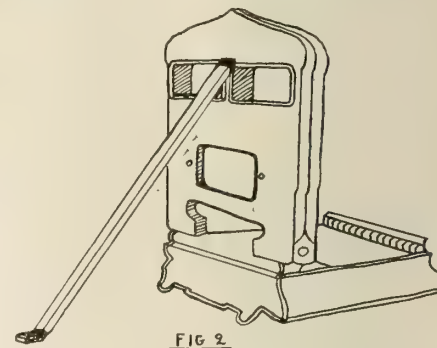


FIG 2

I go below the cellar bottom I will always have water in the ashpit. Just how would you guard against this matter?—J. G. Gleason.

We believe that we should try to induce the owner to let us instal an automatic cellar drainer. You say the cellar is very damp. Probably in spring and fall there are several inches of water in it, and such a condition should be done away with for the owner's and his family's sake. An automatic cellar drainer will remove the water, and if it is kept out, if you place some crushed stone three or four inches deep in the bottom of the pit and then run tar over the stone, afterwards putting in cement, we believe you will not be bothered with water in the ashpit.—Editor.

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VII.

TORONTO, AUGUST 15, 1913

No. 16

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*

(ESTABLISHED 1888)

H. T. HUNTER, *General Manager*

SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

J. G. Lorriman, *Manager*

Alex. Wales, *Advertising Representative*

H. M. Reid, *Eastern Manager*

Edwin Newsome, *Editor*

W. S. Farquharson, *Associate Editor*

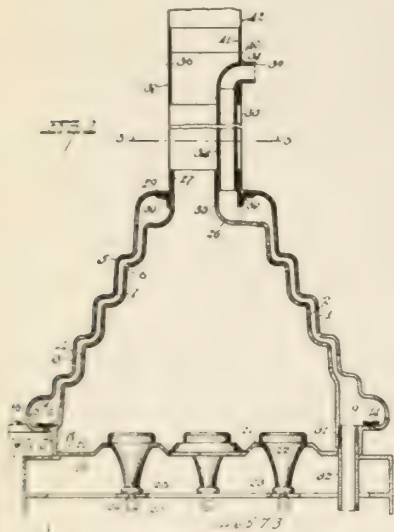
Published on 1st and 15th of each month. Subscription, Canada, \$1.00; United States, \$1.50; Great Britain and the Colonies, 4s. 6d.; Elsewhere, 6s..

Cable Address: Macpubco, Toronto; Atabek, London, England

New Canadian Patents

Frank A. Nieberding, Cleveland, Ohio,
U.S.A., 11th March, 1913; 6 years.
Filed 29th December, 1911. Receipt
No. 204,485.

Claim.—1. A water heater comprising an inner and an outer shell having a chamber therebetween, said heater being provided with wings or projections



No. 146,573. Water Heater.

with recesses therebetween, said wings or projections being corrugated, and means for heating the interior of the inner shell.

2. A water heater comprising an inner and an outer shell forming a water passageway therebetween, said shells being projected outwardly to form segmental wings and being of generally frusto-conical shape, said wings being provided with transverse corrugations.

3. In a water heater the combination of an inner and an outer shell having a chamber formed therebetween, the heater being of generally tapering contour from bottom to top and provided with segmental projections tapering from the bottom toward the top, said projections being corrugated, and means for applying heat to the interior of the inner

4. In a water heater the combination of an inner and an outer shell having a narrow passageway formed therebetween, the heater being of generally tapering contour from bottom to top and provided with projections, said projections being transversely corrugated on the interior thereof, and means for applying heat to the interior of the inner

5. In a water heater the combination of an inner shell of generally frusto-conical shape, an outer shell of similar shape forming a water passageway with the inner shell, and packing rings loosely covering the joints between the inner and outer shells at the top and bottom thereof.

6. In a water heater the combination of an inner shell, an outer shell forming a passageway with the inner shell, and a packing ring or gasket loosely covering the joint between the inner and outer shells.

7. In a water heater the combination of an inner shell having a rib with one edge thereof, an outer shell having an edge adapted to substantially abut against the edge of the inner ring and having a rib within such edge, and a flexible packing ring resting on said ribs and covering the space between said edges.

8. In a water heater, the combination of an inner and an outer shell arranged to form a water heating chamber therebetween, one of said shells being removable from the other shell and there being a space formed between one of the shells and a co-operating portion of the other shells and a packing ring loosely covering the space thus formed between said shells.

9. In a water heater, the combination of an inner and outer shell arranged to form a water heating chamber therebetween, one of said shells being removable from the other shell and there being a space formed between one of the shells and a co-operating portion of the other shells and a packing ring loosely covering the space thus formed between said shells.

10. In a water heater, the combination of an inner and outer shell, means detachably connecting said shells, the outer shell having its upper end directed inwardly and the inner shell having a neck projecting through such inwardly directed portion of the outer shell, and a packing ring loosely covering the joint formed between such neck and the inwardly projecting portion of the outer shell.

11. In a water heater, the combination of an inner and an outer shell, means detachably connecting said shells, the outer shell having its upper end directed inwardly and the inner shell having a neck projecting through such inwardly directed portion of the outer shell, and an angular packing ring covering the space formed between such

neck and the inwardly projecting portion of the outer shell.

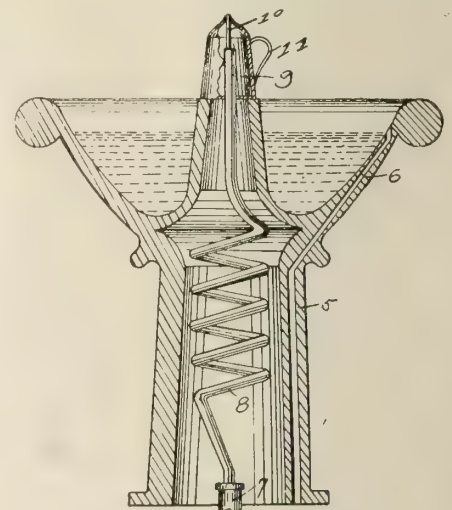
12. In a water heater, the combination of an inner and an outer shell, one of the said shells having an edge in proximity to an edge of the outer shell and at an angle thereto, and an angular packing ring or gasket loosely covering the said space between the said edges.

13. In a water heater, the combination of tapered inner and outer shells arranged to provide a water passageway therebetween and having edges in proximity, and a packing ring or gasket loosely covering the joint or space formed between such edges.

14. In a water heater, the combination of tapered inner and outer shells arranged to form a water passageway therebetween and having their edges in proximity, one of the said shells being provided with an inlet and outlet connection, and a flexible packing ring or gasket loosely covering the joint or space formed between such shells.

Frederick G. Partington, Coeur D'Alene, Idaho, U.S.A., 18th March, 1913; 6 years. Filed 12th December, 1912. Receipt No. 217,902.

Claim.—1. In a public drinking fountain, the combination with a hollow stand, a bowl, an overflow channel lead-



No. 146,726. Fountain.

ing from said bowl, an upstanding central hollow projection in said bowl having a flat upper face and projecting above the entrance to the overflow channel, a source of water supply, a flexible tube coiled within said hollow

(Continued on page 28.)



If you are not familiar with "Victorian" Porcelain Lavatories an investigation will prove of great value to you.

Write for particulars and prices.

The James Morrison Brass Manufacturing Company, Limited, 93-97 Adelaide Street West, Toronto.

Plumbing Specialties



JENKINS' '96 PACKING is made of pure Para rubber and the best ingredients and is lighter in weight than most packings. It is strong, yet flexible, and always uniform. It will stand high temperatures and pressures and can be successfully used under pressure of Steam, Water, Acids and Ammonia. A joint once made with Jenkins' '96, needs no further attention, as it will not rot or blow out.

Stocked by most dealers.

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NEW CANADIAN PATENTS.

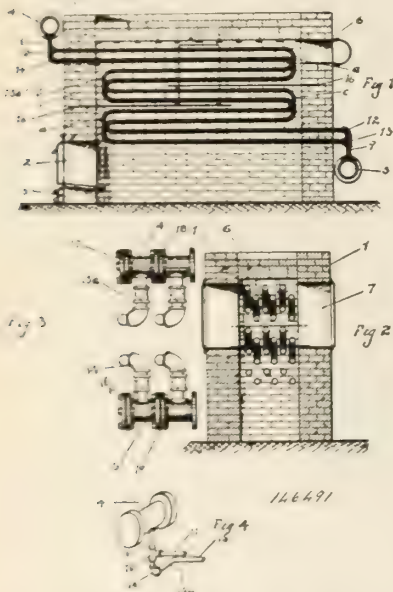
(Continued from page 26.)

stand, a cup adapted to have a seating upon the flat upper face of the upstanding projection to which cup one end of the tube is connected, the other end of said tube being connected to the source of water supply.

2. In a public drinking fountain, the combination with a hollow stand, a bowl and an upstanding central projection in said bowl, of a source of water supply, a coiled flexible tube located in said stand and extending upwardly through said central projection.

Theodore Martin Barr and George James Barr, co-inventors, both of Salem, Oregon, U.S.A., 11th March, 1913; 6 years. Filed 2nd November, 1912. Receipt No. 216,340.

(Claim.—1. A hot water furnace comprising the furnace walls, an upper header disposed transversely adjacent the front end thereof, a lower header similarly arranged at the rear end, and



No. 146,491. Hot Water Heater.

a series of pipe sections extending through said walls and connecting the headers, the body of each pipe being arranged in vertical convolutions between said walls.

2.—A hot water furnace comprising the furnace walls, an upper header disposed transversely adjacent the front end thereof, a lower header similarly arranged at the rear end, and a series of pipe sections extending through said walls and connecting the headers, the body of each pipe being arranged in vertical convolutions between said walls and a second pipe section connected at the lower side of each of the

first-mentioned series at a point adjacent each of said headers, the body portion thereof being arranged in similar parallel convolutions in a plane intermediate each pair of the preceding series.

3. A hot water furnace comprising the furnace walls, an upper header disposed transversely adjacent the front end thereof, a lower header similarly arranged at the rear end, and a series of pipe sections extending through said walls and connecting the headers, the body of each pipe being arranged in vertical convolutions between said walls, a second pipe section connected at the lower side of each of the first-mentioned series at a point adjacent each of said headers, the body portion thereof being arranged in similar parallel convolutions in a plane intermediate at each pair of the preceding series, and baffle plates arranged transversely in staggered relation between said convolutions.

4. In a heating plant, a boiler comprising upper and lower headers, each being composed of a plurality of sections secured together, a pipe section arranged in vertical convolutions between the headers, each end being united to a corresponding header section and a diaphragm secured in one of the headers between two of said sections.

TRADE NOTES.

Halifax, N.S.—Messrs. John White & Co., sanitary and heating engineers, suffered a loss by fire recently.

Blyth, Ont.—Messrs. Moore & Sons, sanitary engineers, hardware and tin-smiths, disposed of their tinsmithing department.

Pincher Creek.—J. M. Maxwell has disposed of his plumbing business here to Stanley Pearson, who has already assumed control. Mr. Maxwell has purchased in Taber the business of Fred J. Schall and is now located in that town.

Lives of great men oft remind us that the book agent is abroad in the land.

• • •

To achieve success, if success is to be understood in its broader and truer sense, becomes an ambition for which any man may well strive. It involves the rendering of the best services of which he is capable to the whole community, and it demands self-development in its highest degree. In a word, the truly successful man will put his heart into his work. His business will become for him a matter of conscience.

Market Report

TORONTO.

During the last two weeks money seems to have eased up a little. Collections are reported as slightly better than expected under the circumstances and present conditions of the money market. Building loans, too, seem to have taken an easier tone, and on the whole the trade seems to have little to complain of.

Soil Pipe.

There is no stock on hand to speak of, and manufacturers report their foundries running full blast. Orders for this commodity are ahead of times, and building operations are reaching a stage when soil pipe is being installed at a rapid rate.

Enamel and Porcelain Ware.

Jobbers are busy making shipments to all parts of the Dominion. Factories seem to be able to cope with the demand fairly well, though no great amounts are on stock to draw from, and money seems to be a little easier than we were able to report last issue of two weeks ago.

Lead Pipe.

Lead is firm, and no change is reported of any material note. If anything at all it may safely be stated to be a little stronger.

Lead Traps.

These have a tendency to become firmer than recently reported. This, of course, is on account of the state of the lead demands. Previous fluctuations in lead had not caused any material change on account of the large stocks on hand, but now these are being lowered, resulting in the prices being governed by the lead quotations which is reported stronger.

Black and Galvanized Pipe.

There is no change in pipe. Demands are very steady, and mills are going at full capacity. There may be an easing up in the course of a few weeks on account of the near completion of a large portion of the building now under construction.

Copper.

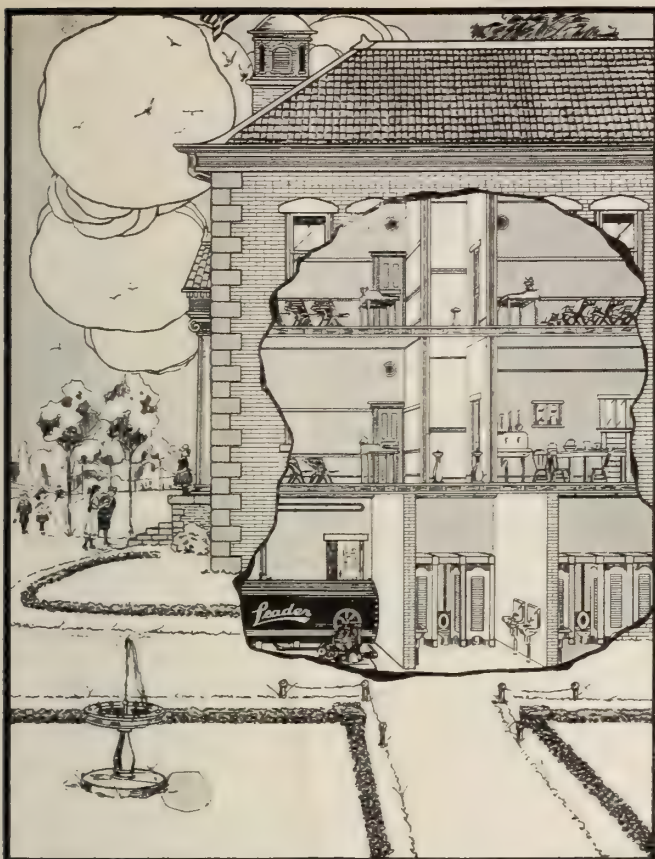
Copper is on a steady rise. There is an increase of 1 cent per lb. since the 1st of August, and it has every tendency to still rise in price. Demands are fairly good, but shipments are a little slow.

Tin.

There is an advance reported on tin to the extent of 3 cents, and every indication of a still further rise. Demands are still in a steady state.

Brass Goods.

Demands are fair, but an extra rush is expected on the nearer completion of buildings under construction.



Above illustration taken from cover of Leaderite, August issue, published monthly by the Leader Iron Works.

Central Country Schools —Coming

Several States have passed laws doing away with the "Little Red School House"—and putting in its place—or perhaps in place of three or four—a substantial two-story eight-room modern building. These schools are located according to population, and inhabitants within a radius of 5 miles or even more, can take advantage of improved educational methods. Through this system of consolidation the authorities are enabled to employ more competent instructors.

Leader Water Supply equipment is being used very generally for central schools—plans and specifications from School Boards and Architects are being received daily calling for a figure on the water supplies. Are you, Mr. Reader, in touch with this work? Has your State such a law? If not, encourage one through your district representatives.

The field in this line is unlimited. Nearly every one admits in this advanced age that in all buildings having at any time an assembly of people, sanitation is a feature of vital importance.

Dealers who make a specialty of selling **Leader** Water Supplies are not compelled to confine themselves to country school work—every institution, county alms-house, farmer, stock raiser and dairyman are subjects for modern water supply material.

SEE CATALOG F.

Leader

"Our mark of gold is a symbol of everlasting value."

Leader Water Supplies

DISTRIBUTORS:

**The GENERAL SUPPLY COMPANY
OF CANADA**

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WINNIPEG

A High Grade Fixture at a Moderate Price

The next time a customer demands a first-class fixture at the price of an ordinary installation, surprise him with the

J-M 1913 Vitreous China Combination



It never fails to make a hit. Positively the biggest closet value on the market.

Bowl and tank of vitreous china. All exposed metal parts heavily nickel plated.

Equipped with J-M Dirigo Solderless Copper Float, Douglas Pattern Flushing Valve and J-M Sanitor Seat. Has water surface of 75 sq. in., with 3-inch water seal.

Instantaneous and extremely quiet in action.

Every J-M 1913 Combination you install means a handsome profit and a satisfied customer.

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H. W. JOHNS-MANVILLE CO., Ltd.**

Manufacturers of Asbestos
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Asbestos Roofings Packings,
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2030

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PRACTICAL TINSMITH WITH \$2,000.00 who can pay out work as partner in an old established plumbing, heating and tinsmithing business in good Ontario town. Sickness causing retirement of present partner. Apply Box 750, Sanitary Engineer, Plumber and Steamfitter, Toronto. (16)

SITUATION WANTED

PRACTICAL MAN IN PLUMBING AND Heating, seeks situation as foreman or supervisor of work. 27 years experience as foreman—Estimator in Montreal. Reliable and sober, English and French. Reply "Position," Sanitary Engineer, Montreal.

MISCELLANEOUS

ADDING TYPEWRITERS WRITE, ADD OR subtract in one operation. Elliott Fisher, Limited, Room 314 Stair Building, Toronto.

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COUNTER CHECK BOOKS—ESPECIALLY made for the plumbing and steamfitting trade. Not made by a trust. Send us samples of what you are using—we'll send you right prices. Our holder with patent carbon attachment has no equal on the market. Supplies for blinders and monthly account systems. Business Systems, Limited, Manufacturing Stationers, Toronto.

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ARMSTRONG STOCKS
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both Hand or Power

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CO.**

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Don't think us impertinent. We want you to put the question to yourself, and to supplement it with the further question, "Could you earn any more?"

Certainly you could, if your wasted evenings could be used to advantage.

Why not let The MacLean Publishing Company help you out? They will appoint you circulation solicitor in your district for MacLean's Magazine.

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TORONTO

Keep in mind the dominant fact that mankind from its first appearance on the earth has been schooled by nature to look for signs; for invitations to taste; for suggestions as to what to wear. Tell your story briefly, forcibly, truthfully, and address it through the proper media and you can successfully apply advertising as a means to increased distribution.

Mechanical Drawing

By **Ervin Kenlson, S.B.**

Instructor in Mechanical Drawing, Massachusetts Institute of Technology

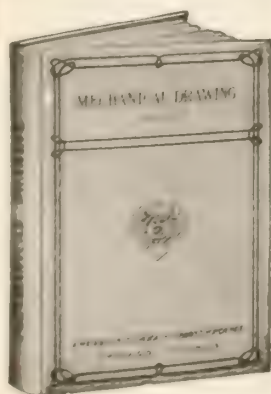
176 pp., 140 illus. Cloth binding. Gives a course of practical instruction in the art of Mechanical Drawing, based on methods that have stood the test of years of experience. Includes orthographic, isometric and oblique projections, shade lines, intersections and developments, lettering, etc., with abundant exercises and plates.

Price, \$1.00

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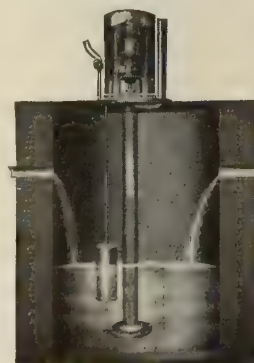


"ECONOMY" SEWAGE EJECTORS SINGLE AND DUPLEX UNITS

will automatically EJECT any QUANTITY of Sewage at any HEAD. They are adapted for MUNICIPAL DISPOSAL PLANTS and CITY BUILDINGS. The ECONOMY may be operated by ELECTRICITY, STEAM or GAS ENGINE.

Write for information on THE ECONOMY DUPLEX DRY PUMP CHAMBER EJECTOR and for the ECONOMY CATALOG.

Canadian Distributors: Francis Hankin & Co., Mail Bldg., Toronto, Ont.; Coristine Bldg., Montreal, Que.; Notzel Engineering & Supply Co., Duncan Bldg., Vancouver, B.C.; J. A. McTaggart, Travelers Bldg., Winnipeg, Man.



Automatic Electric Bilge Pump
Manufacturers
THOMAS & SMITH, Inc., 116-118 N. Carpenter St., Chicago, Ill.

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PREVENT FLOODED BASEMENTS

BY INSTALLING THE
"Little Giant" Automatic Electric Cellar Drainer

You can always depend on it keeping your BASEMENT DRY. It is intended to take the place of the Hydraulic Cellar Drainer, will not stop up with shell fish or lime and will not flood your basement when City Pressure is low as it is operated by a splash-proof Electric Motor, has plenty of power, is always ready and always works.

WRITE FOR FULL PARTICULARS

CHICAGO PUMP CO., 915 W. Lake Street, Chicago, Ill.

We also manufacture the silent running Multi-Stage Turbine Pump, The Automatic Electric Condensation Pump and Bilge Pumps in capacities from 10 to 500 P.M.

PEASE IDEAL STEAM BOILERS

Write to-day for
Catalogue and Prices.

PEASE FOUNDRY CO., Limited

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton, Montreal.

You can talk across the continent for two cents per word with a WANT AD. in this paper.

EASY TO LIFT

Kinnear Improved Pressed Metal Radiators are light. One man can handle a Pressed Metal Radiator of ordinary size while it takes four men to handle its equivalent in cast iron. Every plumber, steamfitter and heating contractor is interested in this fact because of the lower handling costs.

Urge the home builder to use Kinnear Improved

PRESSED METAL RADIATORS

They have many advantages over cast iron, including greater efficiency, which means a considerable saving in fuel. If you figure on a Pressed Metal Installation against your competitor's cast iron installation you can make your bid lower because of the cheaper cost of hauling, handling and installing—or you can put this profit in your own pocket.

Pressed Metal Radiators Pay for Themselves.

Write for our 20 page booklet and catalogue.



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Bailey-Farrell Building - PITTSBURGH, PA.

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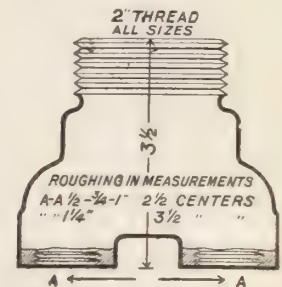
"PERFECTION" RADIATOR FITTING

is unique, it is serviceable, reliable and economical. It embraces all these features and satisfies in every way.

It is adapted to a large variety of uses and makes good on every occasion. That is why we have added it to the National Valve family, and are now handling it exclusively. Literature free on request.



Shows how circulation is established, and freezing is prevented by connecting the unused risers.



Don't forget that we manufacture the "B" Pipe Joint Compound. There are many distinct features about it, which react to your benefit. It's purely a vegetable substance, much lighter than water; every part of it can be used—never changing in consistency, and expands 100 per cent. when confined, and is soluble when unconfined.

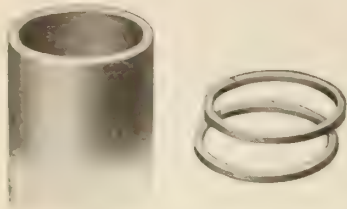
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National Steam Specialty Co.

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Surplus, Dunn & Co., 74 Murray St., New York. L. N. Vanstone, 8 Wellington Street East, Toronto. Moncrieff & Endress, Limited, Scott Building, Winnipeg.

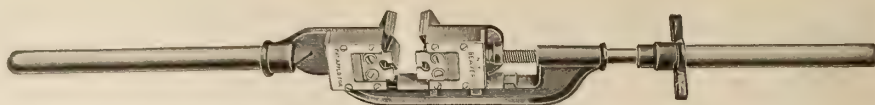
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Cut With "Beaver" Square
End Pipe Cutter.



Done With Ordinary
Pipe Cutter.



The Beaver Square End Pipe Cutter

One Set of Knives
—No Changing



Leaves Clean Square
Pipe End

The "Beaver" cuts off a piece of a threaded end right where it is threaded. It works easier and quicker than a wheel cutter, and saves the extra time of reaming. It cannot split pipe.

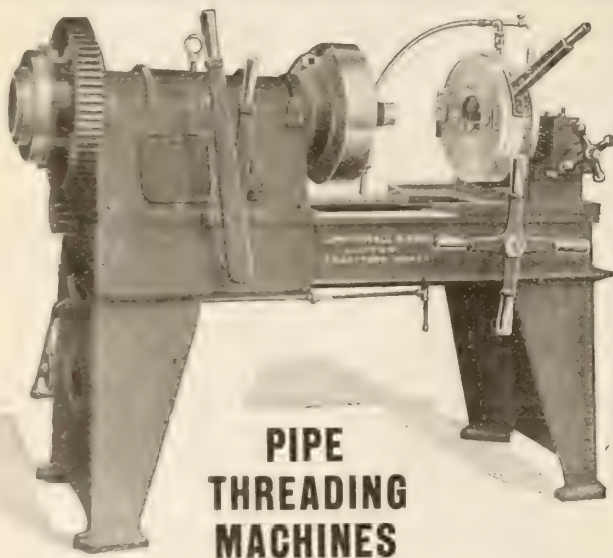
It makes a square pipe end on which threading dies start easier, last longer, and run straight.

You do not feed the "Beaver"—simply close it on the pipe and pull two handles the same as a die stock—the feed is automatic—the form of knives regulates the depth of cut.

The ordinary user does not cut enough pipe in one year to dull the knives.

Give the Beaver a trial and be convinced that it is better.

Borden-Canadian Company, 66 Richmond Street East, Toronto, Ont.

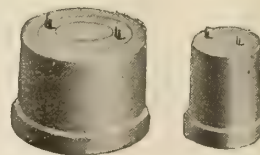


PIPE THREADING MACHINES

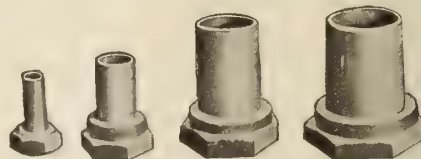
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of the best material and by skilled mechanics, some of them of superior ability, having worked several years on this line in some of the best factories in the United States. Our machines have been in successful operation in all the Pipe Mills, and many of the best Plumbing and Steamfitting businesses in the Dominion for years, and for the above reasons, we believe we can satisfy YOU. We are there with the goods. References cheerfully given. Write us for catalogue.

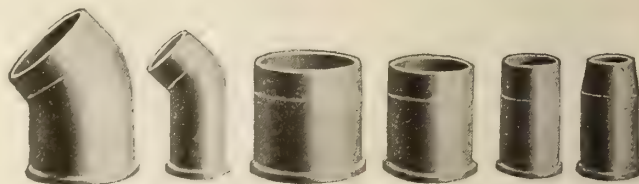
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Cleanouts, Iron Body, Brass Tops



Brass Nipples, Male and Female



Brass Ferrules, Standard and Heavy

Tallman's Reputation is in the Goods

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**Here It Is
Mr. Plumber**



The New "Dale Ball Cock"

**For Low Down Tanks
With Hush and Refill Tubes**

(PATENTED)

The elevated "Dale" is now a reality—
Noiseless—Positive Action—Simple Construction
—Instant Adjustment—Guaranteed. Use it also, the
low down "Dale" pattern for high tanks and your Ball Cock
troubles are ended.

Ask our salesman to show you a sample of it and to quote
you prices or write us and we will quote you.

Canadian Wolverine Company, Ltd.

Chatham, -- Ontario

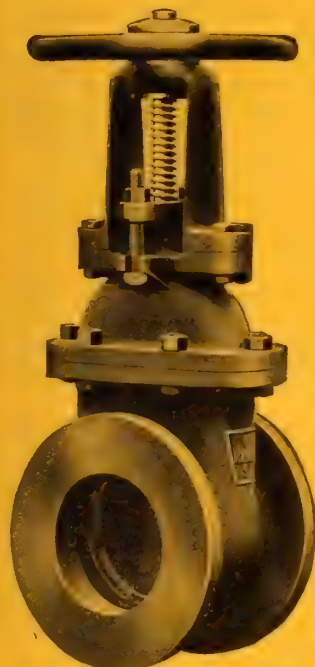
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OUTSIDE SCREW AND YOKE

"KEYSTONE" PATTERN

Embody all the latest features



4 1/2-in. and larger

Screwed in Seats

Deep Bronze
Bushed Gland
and Stuffing
Boxes.

Full Opening.

Large Diameter
Hand-Wheels.

Solid Wedge
Discs.



4-in. and smaller

Narrow face-to-
face Dimensions

Symmetrical
Design.

Good Material.

Interchangeable
Parts.

Guaranteed
Tested.



4 1/2-in and larger

The Kerr Engine Co., Limited, MANUFACTURERS
Walkerville, Ontario

ARE YOU FAMILIAR
WITH THE PRODUCTS OF—



Representatives:

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This is our open front reinforced closet seat with heavy bar hinge and full $1\frac{1}{4}$ inch stock.

We carry a full line of high-class closet seats of the latest sanitary designs and in all the standard finishes, and if necessary we can match perfectly the woodwork of any room if a sample is supplied us.

Write us for Prices.

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Vol. VII.

Publication Office : TORONTO, SEPTEMBER 1, 1913

No. 17



THE STANDARD

COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA



COLONIAL—PLATE F109

Porcelain Enameled Allover Lavatory on Pedestal, with Compression Combination Supply and Waste Fitting, $\frac{3}{8}$ " Supply Pipes with Stops and $1\frac{1}{4}$ " Close Connection Trap with Vent.

Ideal "COLONIAL" LAVATORY

A "Medium Priced"
High Grade Fixture

Actual Size 22" x 27"
Oval Bowl, rear outlet $11\frac{3}{4}$ " x $14\frac{3}{4}$ "
Apron $4\frac{1}{2}$ "

F109 Complete, as described—List..	\$63.00
F109 Less Fittings—List.....	30.50
Approximate Weight.....	205 lbs.

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410 CARTER COTTEN BLDG

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

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MANITOBA and NORTHWEST:
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120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
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WAREROOMS :

MONTREAL WINNIPEG VANCOUVER

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“Standard Sanitary” Modern Bathroom



Design P—55.

This bathroom illustrates a simple, but extremely practical and beautiful interior and shows how successfully beauty and utility can be combined. The simple shower over the tiled-in bath offers the maximum of bathing facilities with the least possible equipment and display.

Lavatory is the “Standard Sanitary” “Narova” design, a pattern that has proven very popular on account of its handsome appearance and excellent quality. It is enamelled all over, free from cracks and crevices, and is easily kept immaculately clean and sanitary.

The Closet is of the Metric Flushing Valve type. Its operation is accomplished by pushing momentarily a small index button, and is guaranteed to thoroughly flush the bowl at each operation.

All Closets of this type, operating on direct pressure, should be supplied with water at a minimum pressure of ten pounds through a full 1¼-inch I.P. size supply pipe to each Closet.

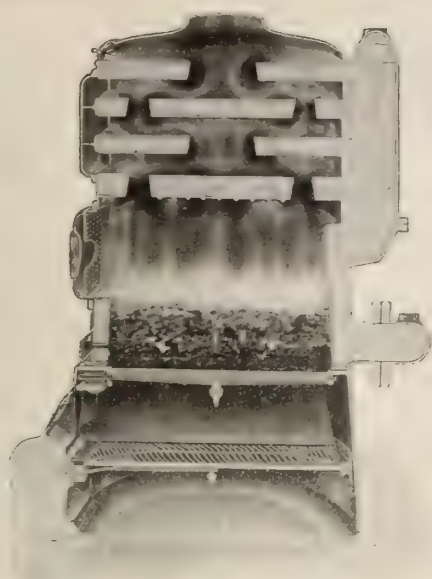
“Standard Sanitary” plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory :
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store :
55-59 Richmond Street East.

Hamilton Store :
20-28 Jackson Street West.



The
“DAISY”
 Hot Water Boiler

Over 50,000
 in Use

Speaks for Itself!

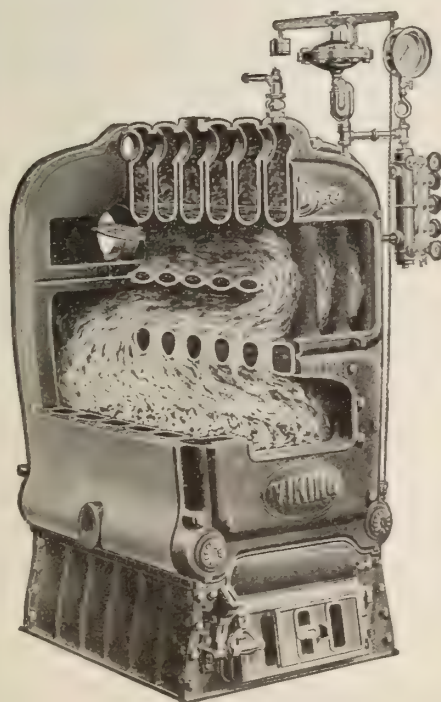


WARDEN KING LIMITED, MONTREAL
 Branch, 27 Lombard Street, TORONTO

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 The MECHANICS' SUPPLY CO., QUEBEC, QUE.
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We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



Our
“VIKING”
 BOILERS

For STEAM or HOT WATER

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They are easily regulated
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HONEYWELL HEAT GENERATORS are recommended and sold in Germany by the leading dealers in heating equipment.

There, hot water heating plants must pass a rigid inspection before acceptance, and sealing hot water systems is governed by law. There, as in England and other foreign countries where there is discrimination, Honeywell Heat Generators are chosen when seals are used.

Whenever an absolutely safe and dependable sealed or safety valve is required for holding a pressure of either water or air, that will relieve any excess pressure beyond that required, but positively hold the desired pressure, the Honeywell Heat Generator is specified.

Honeywell Heat Generators are built in several sizes and for various pressures and purposes.

It is the only seal that will operate for years without attention and can be installed with absolute assurance that it will continue to perform its function without the care of an engineer.

If you have'nt a copy of our fitter's hand book write for one. It tells all about Honeywell hot water heating.

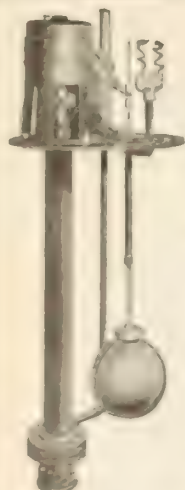
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You can always depend on it keeping your BASEMENT DRY. It is intended to take the place of the Hydraulic Cellar Drainer, will not stop up with shell fish or lime and will not flood your basement when City Pressure is low as it is operated by a splash-proof Electric Motor, has plenty of power, is always ready and always works.

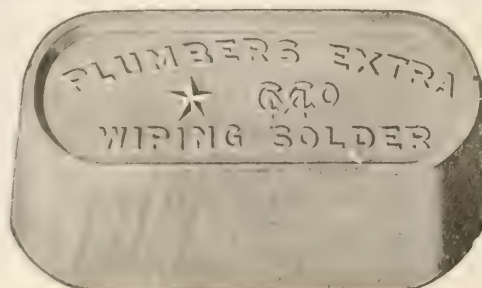
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The Highest Grade
Wiping Solder. The same
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For a First-Class Joint
buy the Solder with the Tin
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Use only Extra Star Wiping.

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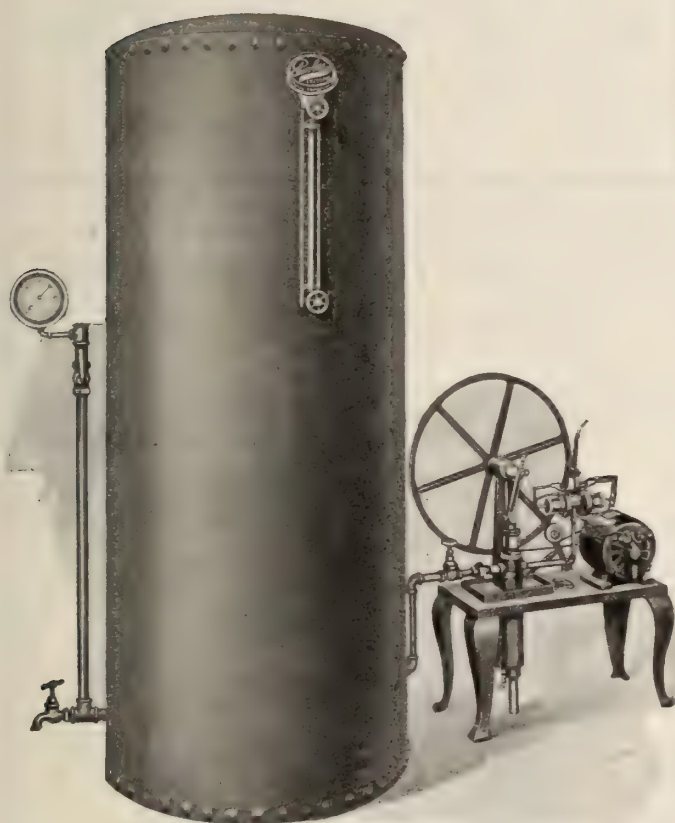
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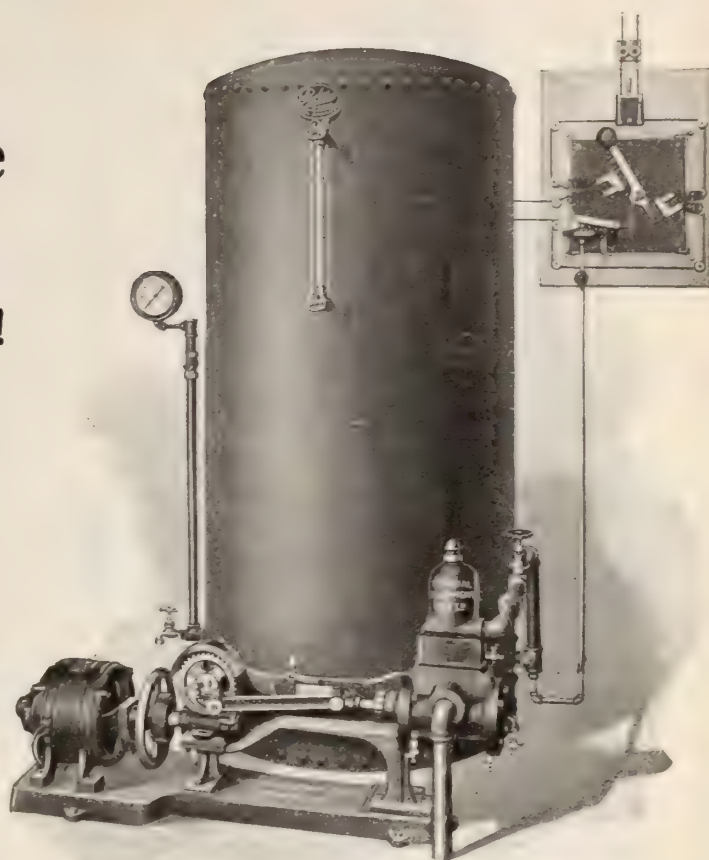
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Against 40 Pounds Pressure

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We build Peerless Systems complete, except the motors, and of these we buy the most expensive made. Do you know of any other firm of which this is true?

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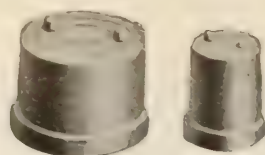
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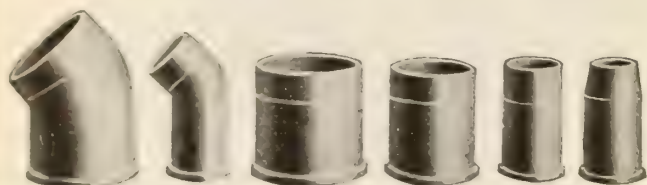
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Brass Nipples, Male and Female



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Tallman's Reputation is in the Goods

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Standard Practical Plumbing

By R. M. Starbuck

347 SPECIALLY MADE ILLUSTRATIONS

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"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

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It is practically impossible for this float to corrode at the joints.

The flanges are folded over on each other and double locked under tremendous pressure by a patented process. No rubber gaskets. No solder. No red lead or any other material subject to deterioration.

Made in 4 and 5-inch round types from pure 12-oz. sheet copper, with brass spud, attached by same process.

Has sufficient weight and buoyancy to open and close any standard type valve.

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Manufacturers of Asbestos
and Magnesite Products.

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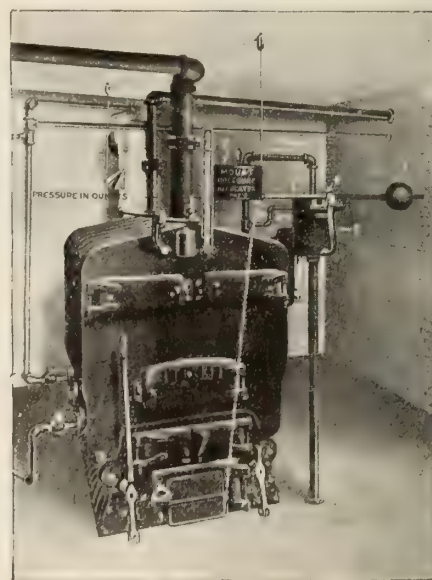
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Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

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**I'M
NYE
the
Die
Man**



This is a straight talk on the Nye Solid Die Stock, there isn't a joke on the page. If you really want to know why the Nye Solid Die Stock is superior to others, read this. It won't take but a minute, and some day you may want to know.

The Nye Solid Die Stock

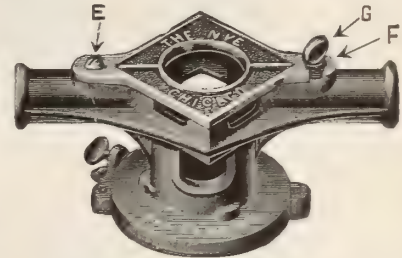
has automatic adjustable bushings, large openings for easy oiling, extra room for the discharge of chips, thereby preventing clogging; the handles are hollow through the body of the stock—this permits chips and oil to get away from the inside. The die plate cannot become separated from the body of the stock or swing loose in use. The automatic bushings are governed by a thumbscrew, easily operated with one hand—you never have to hunt up lost bushings.

My tools absolutely save money for every intelligent user. I sell all of them under the Nye Guarantee—a free trial and money back if they are not what I claim.

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BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a Want Ad. in this paper.

PEASE IDEAL STEAM BOILERS

Write to-day for Catalogue and Prices.

Pease Foundry Company
LIMITED

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton,
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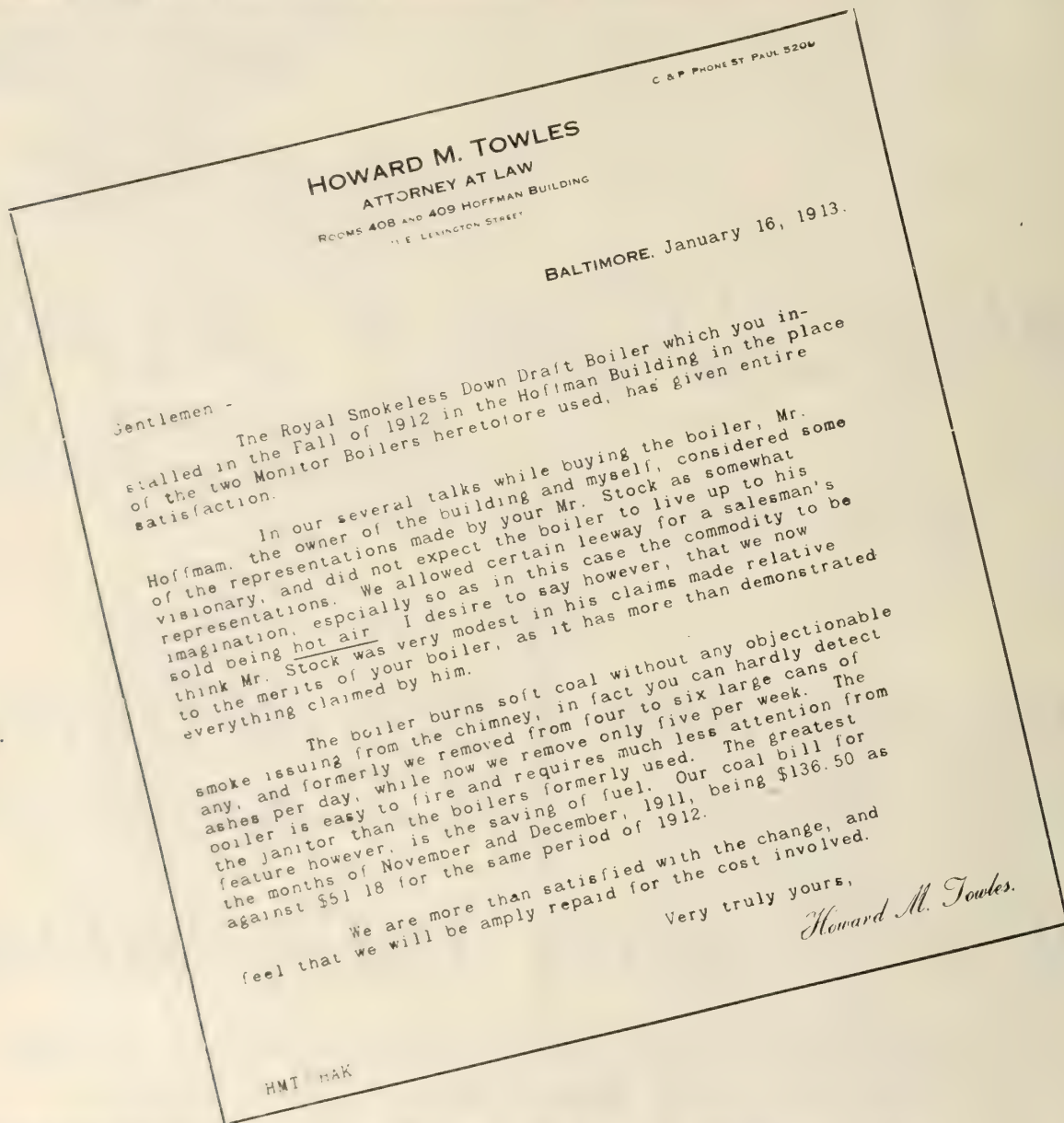
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We Guarantee The ROYAL SMOKELESS WATER TUBE BOILER to Save 25 to 33 $\frac{1}{3}$ per cent. of Fuel

The double grate and combustion chambers of this boiler are so arranged that 90 per cent. of smoke is consumed, thus effecting an enormous saving in fuel.

Soot cannot collect in chimneys, smoke being practically consumed. Very little soot clings to the flues of the boiler. It burns soft coal and eliminates the smoke nuisance. Requires very little attention. No brick work necessary in connection with this boiler. Not necessary to tear down a section of building to instal—the Royal can be carried down any ordinary stairway—in sections.

A 4,000 square ft. Royal Smokeless Boiler is the one used in the Hoffman Building as per following letter.



STEEL AND RADIATION, LIMITED

HEAD OFFICE, Fraser Ave., TORONTO

Branches:

138 Craig Street, West, MONTREAL
101 St. John Street, QUEBEC

Showrooms:

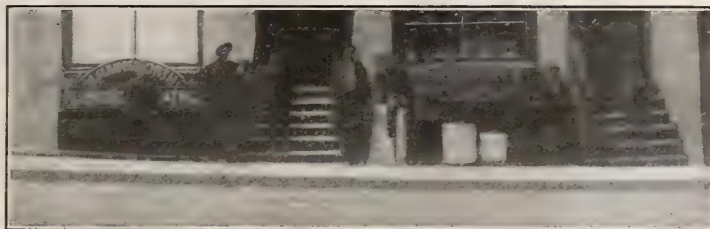
80 Adelaide Street East,
TORONTO

Agencies in all the leading Cities in Canada

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

Modern Premises and Plant of Sanitary and Heating Engineer

The Remarkable Development of a Sanitary & Heating Business in Berlin, Ontario.



In Space of a Few Years Evolves From a Basement Shop to Large Premises on One of the Main Thoroughfares.

In the year 1894 John Hainsworth and William Clarke took the premises shown at the head of this column. It was a basement store and workshop. Two months afterwards the partnership was dissolved and John Hainsworth took over the whole business. There he forged ahead under all kinds of difficulties which one must experience in such a place of business for without a doubt a basement is a poor start for a sanitary and heating trade. The very nature of such an occupation warrants the very best of natural light, etc., the inconvenience of having all stock and material to carry up and down stairs is not conducive to efficient results and cannot either be a fit place to bring one's customers to inspect the sanitary aspects of the trade.

However, Mr. Hainsworth made good by taking personal care of the small details, of which there are thousands in this particular line of calling. Business increased to such a great extent that new premises had to be acquired. New lines had to be included, and now Jno. Hainsworth occupies a very fine position on one of the main streets of Berlin.

His present show room and office occupy an area of 2,850 square feet floor space, and his stock is as nice an assortment of sanitary, heating, lighting, stoves and ranges as it would be possible to acquire. Sanitary and heating department occupies space of 1,075 square feet, is equipped with gasoline engine power, which drives the different machinery used for cutting and threading pipe.

The tinsmith and sheet metal department is one of the finest to be found west of Toronto. Every machine or tool which would be the means of saving labor has been put into this plant. Lots of light is to be had in this part of Mr. Hainsworth's establishment, and nothing is so desirable to a tinsmith workshop as lots of light.

A very neat stock room is another important feature in this establishment, which occupies an area of 675 ft., viz., 45 ft. x 15 ft., which allows ample means of getting at the stock with the least handling.

STOVES and RANGES



J HAINSWORTH
SANITARY and HEATING ENGINEER
GURNEY-OXFORD STOVES and RANGES
BERLIN

During the time, dating from 1894, Mr. Hainsworth has had a steady increase in business, and now has a staff of 14 on the payroll, which means that he must have a very desirable amount of satisfied customers bringing in their repeat orders from time to time.

Mr. Hainsworth is a great worker with the association. Because of his

earnestness and high esteem which his competitors had of him he was appointed to represent the Berlin Sanitary and Heating Engineers at the annual Convention of the Ontario Society of Domestic Sanitary and Heating Engineers held in Toronto during the earlier part of the year; and in June he was also delegated to represent them again at the National Convention of the Domestic Sanitary and Heating Engineers in Montreal. He is one of the many who have proved to give the public every satisfaction, and is one of the apprentices of the late Jno. Ritchie, of Toronto, so is well known by those engaged in the craft as a thorough craftsman in his line.



How Much of This is Demanded to Supply the "Leaks?"

Montreal heads the list for consumption of water. She needs 70,000,000 gallons per day.

Toronto comes next and takes about 45,000,000 gallons per day.

Other Canadian cities take about the same per capita, which is on an average of 113 gallons per day for every person in the cities where they have water-works.

We venture to state that at least 40 per cent. of this can be accounted for by leaks.

The total cost of maintenance per annum is about \$3,435,000, and to be very conservative \$1,000,000 of that could be saved by "fixing the leaks."



Seventeen Grocers Arraigned Before the Courts in Montreal.

Some time ago 17 grocers in Montreal were brought before the courts for adulterating lard with cotton seed oil and pepper with sand.



Present premises occupied by John Hainsworth and situated on Foundry Street, Berlin, Ontario.

MONEY SAVERS FOR THE SANITARY ENGINEERS.

"Good Soldier." Just watch your man wipe a joint with solder a few cents a pound cheaper. Then give him the best and time him, and you will find he can save nearly as much time as the whole lot of solder cost in the first place, and your customer has got a better joint, which has cost you less. "This is no dream."

Your journeyman is the earning power of your business. His time costs

you on an average from 60 cents per hour to as much as a dollar, according to the locality your business is situated.

Then see that his tools are first class, and if he hasn't got them, get them for him, or else get rid of him. A first-class workman never tries to use poor tools; it costs him too much man power to give you value for money. The work he is doing is of no interest to him. It is a poor job for your customer and a costly job for you.

This is gospel. So see your men have good tools.

Here's the Time Savers.

Good solder, clean tallow.

Sharp shave hook.

Sharp tap borer.

Sharp keyhole saw.

Good rasp.

Up-to-date pipe cutter.

Ditto stocks and dies.

And last, but not least,

Plan your job before you start and get your price for it.

Your heart will be in the work, and things will go on like heaven, instead of—

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

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Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - *President*

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Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, SEPTEMBER 2, 1913

PUBLIC PROTECTION

vs.

' SPECULATIVE BUILDING.

There is, and has been a great deal of discussion recently as to who should dictate the proper size of boiler and quantity of radiation necessary in our homes. The speculative builder at present is becoming a menace. He takes the stand that he is paying for the installation and just insists on having what he specifies.

Now this is a serious matter to take up. It is one which the public at large are very much interested in. It is one which is also a menace to the manufacturers of boilers and radiators, as well as the engineer who installs the system. Manufacturers have spent thousands of dollars in preparing data as to the heating capacity of the different sizes of boilers. They are still continuing to do the same, all with a view of giving the most satisfaction to the users of this commodity.

They are for ever going to further expense by way of producing a better furnished production. They guarantee the different sizes of boilers to give off so much heat.

The Radiator Problem.

Radiators too, have been the cause of a great deal of expenditure recently in designs, etc., so as to give off the proper square feet of radiation with the least amount of friction.

Then comes along the speculative builder and contractor with his specifications which are anything but correct. They ask that a certain amount of radiation should be put in, a certain size boiler too, must be supplied.

Then comes along the engineer who is asked to install the heating system, takes out his book and rule, measures up the whole number of rooms and then the square feet of glass and other exposed portions of the building.

He studies the location generally only to find the boiler too small sometimes by two sizes, the radiation is often 25 per cent. too little to give proper comfort and in some cases the heating engineer will protest only to find the chance of doing the work is taken away from him or on the other hand the builder protests that he is paying for it and intends having what he wants. His cry is often that the engineer wants to get too much out of the job, etc., or that he, the builder, thinks a cool room is more healthy than a warm room. That may be the case, but the heat can be controlled at the boiler if it is sufficiently large. This is the proper place to control the heat. Not by reducing the size of the boiler or quantity of radiation.

One firm of boiler manufacturers made a statement that over 300 cases of hot water heating had been inspected by them where there were complaints that the boilers

were not giving enough heat and the trouble was that the boilers were found to be too small and not enough radiation in the rooms. These complaints are very serious to manufacturers, and it is the duty of the heating engineer to see that these boilers which are installed are large enough.

The jerry builder gets full price for a house heated by hot water. He always makes several hundred dollars more for a house which he can say is fitted up with hot water.

The fact of the matter is he is discounting the earning capacity of such concerns who are producing boilers and radiators, as well as using the heating engineer as a "Cats paw" to enrich himself. This is done at the expense of three parties, viz: The manufacturers whose goods are given a bad name by those living in the house because they cannot get heat enough in spite of the large amount of fuel they burn.

Second.—The heating engineer who installed the system, and who gets blamed for installing a system which will not heat the house; and Third.—The people who buy or rent the house and pay extra for it on account of it being heated by hot water.

The only people who make anything out of these homes are the builders or speculators in buildings and the coal man.

The same trouble applies too, in cases where large steam plants have been installed. Not very long ago the writer was asked to look over some specifications for a building where the radiation required is over 5,000 square feet and the boilers are rated at 4,350 feet in round figures.

This plant is going to be installed if the heating engineer is fool enough to do it, and the job will cast reflections on him for a certainty. It will also reflect on the boilers. Then there is the standpoint of health.

The public at large have to be considered. Houses whether built for the builder's own home may not always be owned by him or her, hence some law governing this matter should be brought into force. It is just as essential to humanity that homes should be properly and sanitarily heated. They must be comfortable, and as mentioned before if there is ample radiation and boiler capacity and some one who likes a cool house, why it is easy to burn less fuel, not force the boiler too much.

When it is necessary to force a boiler a larger per cent. of heat units are going up the chimney than is being converted into steam or hot water, as the case may be, while on the other hand if a boiler with, say 25 per cent. more rating is installed and there is 10 to 15 per cent. more radiation added than is absolutely necessary, the

system is bound to give satisfaction, providing the piping has been installed in anything like mechanical lines.

Such a system will require less fuel to heat the house more comfortable, the fuel will be allowed to burn slower, hence spontaneous combustion will take place and the maximum B.T.U. in the fuel will be converted into radiating energy instead of being forced up the chimney.

It is to be hoped the day is not far distant when the health departments in our towns and cities will have heating and ventilating engineers on the boards of health. When it will be necessary to submit the heating plans and the amount of radiation with capacity of boilers will have to be considered by that board. Then and only then shall we have more uniformity in heating. Manufacturers will receive credit for their products in a fair way, and heating engineers will not be called on to jeopardize their reputation by unscrupulous builders whose only aim is to refer to a house as being heated with water or steam as the case may be, irrespective of the quantity of square feet radiation or boiler capacity.



EDITORIAL COMMENT.

A clean, tidy store or workshop has the appearance of being sanitary.

Save water, fix the leaks, reduce taxes, make business.

* * *

An untidy store or workshop should be not part of a thorough sanitary engineer.

* * *

Money will not buy or pay for the inspiration or aspirations of an earnest effort.

* * *

A good job is an everlasting asset. A poor one a future liability which has to be met with compound interest.

* * *

Time means money, is an old saying, but we are beginning to realize that water is money when we find it being spent by our cities in million lots.

* * *

If you give a price on a job, then when you are well on with it you find you are going to lose money, don't begin and skimp the job thinking you will break even.

* * *

Several sanitary engineers have a vacuum cleaner on exhibit in their places of business and demonstrate its good qualities right there by simply turning on the switch.

Canadian Association News

WINNIPEG ASSOCIATION NOTES.

Commenting on debate which took place at the annual National Convention held in Montreal, the following is a letter sent to John Watson, Esq., vice-president of the Canadian Society of Sanitary and Heating Engineers, which appears for itself:

July 18, 1913.

John Watson, Esq.,
Westmount,

Montreal, Que.

Dear Sir,—At the last regular meeting of our association I was instructed to write you in reference to your remarks at the Montreal Convention re this association, and it gives me pleasure to assure you that instead of this association "not being with you" that we are, and would affiliate with the parent body but for the fact that, being a new organization and young, we are not naturally in a position financially to do so.

Further, we wish to correct you in your statement that "The reason Winnipeg is not with us today is the result of a meeting of Sanitary Engineers and Plumbing Inspectors." This association was formed previous to the formation of the Institute of Sanitary Engineers, and therefore, would not be influenced in any way whatever by the organization of that institute. The Insti-

tute of Sanitary Engineers is a different organization from the Sanitary and Heating Engineers' Association, and I believe there is absolute need of such an organization in this country.

We, therefore, want you to disabuse yourself of the idea that we are not with the parent body. To have this impression corrected is the wish of

Yours sincerely,

DOMESTIC SANITARY AND
HEATING ENGINEERS'
ASSOCIATION.



ONTARIO SOCIETY NOTES.

Garrett F. Frankland, corresponding secretary of the Ontario Society, reports several locals are being formed, he having paid a visit to these towns recently, Peterboro being one which it is hoped will affiliate in the near future. The following are the names of those in Peterboro who have applied for membership: F. R. McPherson, Messrs. Adamson and Dobbin, A. W. Archibald, R. Duranceau, George Burton, R. J. G. Sutherland and R. G. Sturgeon.

Stratford, too, is coming in soon. This is cheering news. It is only by meeting each other on mutual grounds and discussing our grievances in a brotherly matter that we may hope to succeed.

The following gentlemen made application for membership: Messrs. McDermid Bros., Messrs. McDermid & Kyle, F. J. Sylvester, Frank L. Duggan, Messrs. Peter & Sylvester, Messrs. McDonald & Henry, J. R. Myles & Sons.

Kingston, too, are considering the matter of forming a local society, and we hope in the near future to report progress from that city.

There is also an application for membership from Frank J. Short, Galt, lately one of the partners of Ross & Short, of Galt, Ont.



A PRACTICAL TEST.

If a builder asked you to install less radiation than you thought necessary to heat a home or a boiler which was too small, would you do it even if he paid you your price?

"No, sir." "If I did I'd be helping to ruin the boiler manufacturers' reputation and actually ruining my own."

The price is only the secondary consideration after the job's done.

But an installation which is short on boiler and rads. will be long on bad advertising, which will draw double pay at your cost with compound interest.

Analysis of Canadian Sanitary By-laws

All Canadian Cities Have Quite a Number of Clauses Which to a Certain Extent Are in Common With Each Other, While Some Clauses Are Much More Definite Than Others—Ottawa By-law No 2,262 And Amendments to Date Will Be Commented Upon.

Second Series—

In opening this second series we may state for the benefit of our readers that Ottawa is about to make several very important changes in their by-law in the near future which will be for the benefit of the public.

Section I., Clause 1, reads:—

There may be placed in main house drain, inside the wall, a ventilation hand-hole cleaning trap of approved description, and make.

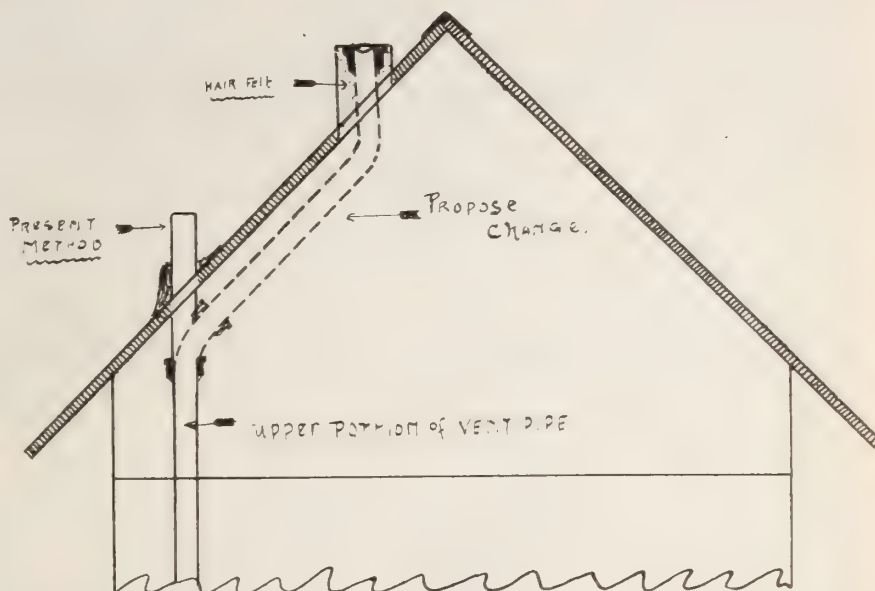
This clause, as will be seen, is purely optional, and left to the will of the parties interested. The trap can be installed or left out. That is the reading of the clause, but the writer was in Ottawa and installed considerable work, yet was never asked to put a trap on the main house drain, neither did he hear of anyone installing one. The authorities are thoroughly convinced that no trap is far better practice than with one.

Clause 2 again refers to the main house trap, which, as aforesaid, is really optional. This clause also refers to a breather which would need to be used if the trap was installed. Although when referring to the breather, there is a stipulation that it be placed, using the words in the clause: "To be situated as remote as possible from any opening into the house," etc. Those few words imply a great deal. They imply that there is a certain amount of danger in these breathers, which have been so universally discarded in most of the large cities all over the world. Yet here in Canada we have one or two towns and cities who actually enforce them. Ottawa is to be complimented for the way her health authorities have taken this particular matter up.

Clause 3 reads as follows:—

All soil pipe within the walls of any building shall be of cast iron, except when covered with earth or concrete, and shall continue at least three feet above any opening, except when a hopper roof is used. But in such cases the hopper shall be at least ten feet away from any opening.

All soil or vent pipes when they pass through the roof shall be properly flashed and made water-tight; and all vitrified clay pipes when used shall be of good quality, and subject to the approval of the inspector.



Suggestion as to method and position in roof where vent pipe should be placed.

We find, however, that the portion referring to the use of tile pipe is repealed in an amendment under by-law No. 2,918, section 3, which reads:

All soil pipes within the walls of any building shall be of cast iron, shall have placed at the foot thereof a quarter bend of cast iron, with a stone or cement base immediately under the same, with 3 feet of cast iron pipe running from the bend horizontally and connecting with the tile drain.

The latter portion of this amended section refers to the weight of sheet lead to be used for flashing, which is 5 pounds to the square foot, whereas in the by-law 2,262 the weight was not compulsory.

Clause 4 is general, but one point in it strictly forbids the use of any 90 degree branch, viz., all junctions or branches must be of 45 degrees.

Clauses 5, 6 and 7 are general, and are embodied in most every other cities' by-laws.

Clause 8 reads:

No trap vent pipe shall be less than four inches in diameter where it passes through the roof, and all vent pipes shall continue to rise after leaving the trap and pass out through the roof or connect with the soil pipe.

Considerable discussion has taken place as to the best method and place to terminate these vent pipes, the diffi-

culty being they are apt to freeze up or become almost closed with hoar frost. This is not as apparent in some districts, but where the temperature has a tendency to fall down to from 20 to 50 or 60 degrees below zero, this hoar frost trouble is a condition which has to be seriously considered, and what is more, while in some localities where this trouble is overcome by protecting the portion projecting through the roof with a covering of hair felt, in other districts this would be absolutely useless, and those who do not feel the trouble can scarcely realize the seriousness of the other man's case.

We are making a suggestion which was referred to us recently by one of our readers, and the argument is that the portion of vent pipe which follows the line of slope to the peak of the roof is apt to be warmer; the sun will also be beating on the portion which protrudes through the roof. This piece, of course, should be as short as possible. There would be no fear of water draining down this pipe because of there being so little distance from the peak of roof to upper lip of the soil pipe vent.

Clause 9 is general, and refers to the terminus of the vent pipe.

Clause 10 specifies the sizes of vents required for w.c.'s, as follows:

Vents from water closet traps shall be 2 inches for three closets,

(Continued on page 20.)



Family picnic gathering on Centre Island, Toronto.

Just a Happy Picnic on the Island

During the Slack Time a Few of the Toronto Bunch Enjoy Such a Gathering as This by Way of Passing Away the Time.

We often hear of the sanitary engineers getting a calling down, or else a "blowing up," but here is an instance when one actually got the boot, and the above picture proves that Reid got the boot this time. However it was not in a painful matter and not the results of a "kick" either.

They're a happy crowd in spite of the trials and troubles which have to be encountered by those who share the lot of "Trying to please everybody."

This was not a picnic in an official way, but just a family gathering. Some brought their own families, some other folks' families, and some had none to bring. But where there was a vacancy by the lack of offsprings "Snookums" made up for it.

No one seemed to enjoy the picnic better than Snookums. He went around the Island in great style and got into all kinds of S-nooks and corners. Everybody got acquainted with him and

his behavior won the praises of every person present. He too got the "jug" and seemed to enjoy it far better than getting the "boot." In fact he seemed to be far more desirable than "Baby Snookums of New York."

Although he has done cutting his teeth we haven't heard of Harry Ruddick or his good lady losing any sleep.

We omitted to say that Snookums is "Ruddicks Bull Pup."

This crowd was great at the game of hand ball, on account of their being such a Handy bunch.

Free rides on the merry-go-around were indulged in by one and all.

Fullerton was there. Oh yes; who could expect to have a good time unless W. E. was present. He is always in earnest whether on business or pleasure

bent and anyone trying to talk "shop" at a picnic with jovial Fullerton will certainly be up against it.

Some of the ladies went through the familiar ordeals of a wedding by being liberally showered with confetti. They, too, gave some fine illustrations of "How to be happy though married."

Needham was master of ceremonies at the merry-go-round.

Fullerton was "Lord High Admirable" of the boating excursion at which he handed out chocolates to the ladies and children.

Ladies Smythe, Farthing, Needham, Reid and Fullerton "ministered" to the interior in great style.

Friend Boddington kept his weather eye on the water w— no melon. It was



1. At dinner; 2. Maxwell; 3. Ruddick and better half; 4. Mr. and Mrs. Smythe and Son; 5. Frankland and family; 6. Miss Winona Frankland and uncle.

heard later that he has quite a failing towards water melon. Some prefer custard pie, but it wasn't on the menu.



SWAPPING DOLLARS.

Whenever you are tempted to put in a low price, remember it is the net profits that count, and not the volume of business you do.

If you make no profit on jobs you do you are not making money. No matter how much business you are doing.

"You are just swapping dollars."

And you cannot simply swap dollars and take money out of your business for improvements and personal use. Not for any length of time without getting into serious financial shape sooner or later.

HUSTED.



KEEP WATER SUPPLIES PURE.

There is not the slightest doubt but we shall soon be receiving benefits all

along the line re the pollution of our lakes, rivers and streams. Several of our cities cannot help, but realize that it would be cheaper to keep our water supplies pure, which Mother Nature has placed at our very door, than go miles away for a new source of supply, which in many cases are not to be compared either for quality or volume.



LEAKS IN THE HOUSES.

One cannot emphasize the necessity to look up all the sources of waste. The only proper way, of course, to solve this problem before installing large plants to practically supply the leaks would be to adopt a meter system in almost all large cities. All the manufacturers who are great consumers of water pay for it by meter. They are satisfied with such a course, and in looking over these plants one very seldom sees any waste in their water supply, simply because any leaks in their establishment are very apparent when the water meter records are charged for.

THE PLUMBER.

We had a gentle plumber once.

We thought he came to plumb;
But by the time his coat was off
His dinner time had come.

He went at twelve and stayed away
An hour and minutes forty;
He 'wiped a joint,' then wiped his lips
Then trotted off so harty!

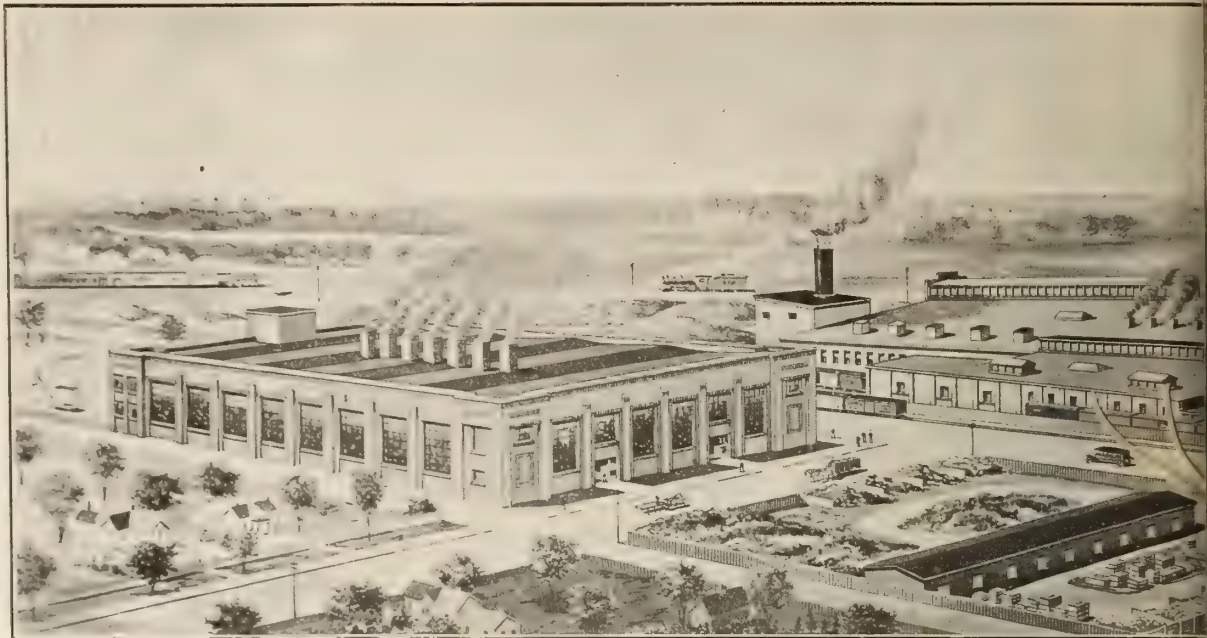
The pipe was only half an inch
(In width I mean, not tall).
Yet you could drive a motor through
The hole cut in the wall.

And after having had his fill.
Oh! see him slow returning!
"To one day's work" is on the bill—
He's thus his living earning!



P. P. Raby & Co., plumbers, Montreal,
have dissolved.

Weyburn, Sask. — Geo. Lighthgre,
plumber, has started business here.



GET

This organization

Deliveries of heating supplies last fall had to take his men off jobs through lack of

We want Gurney-Oxford fitters to get so Three large cupolas—a tonnage surpassed by

We've materially increased our stocks an enormous assorted stocks of everything for

Back of these facilities, there is an organization service, and a square deal.

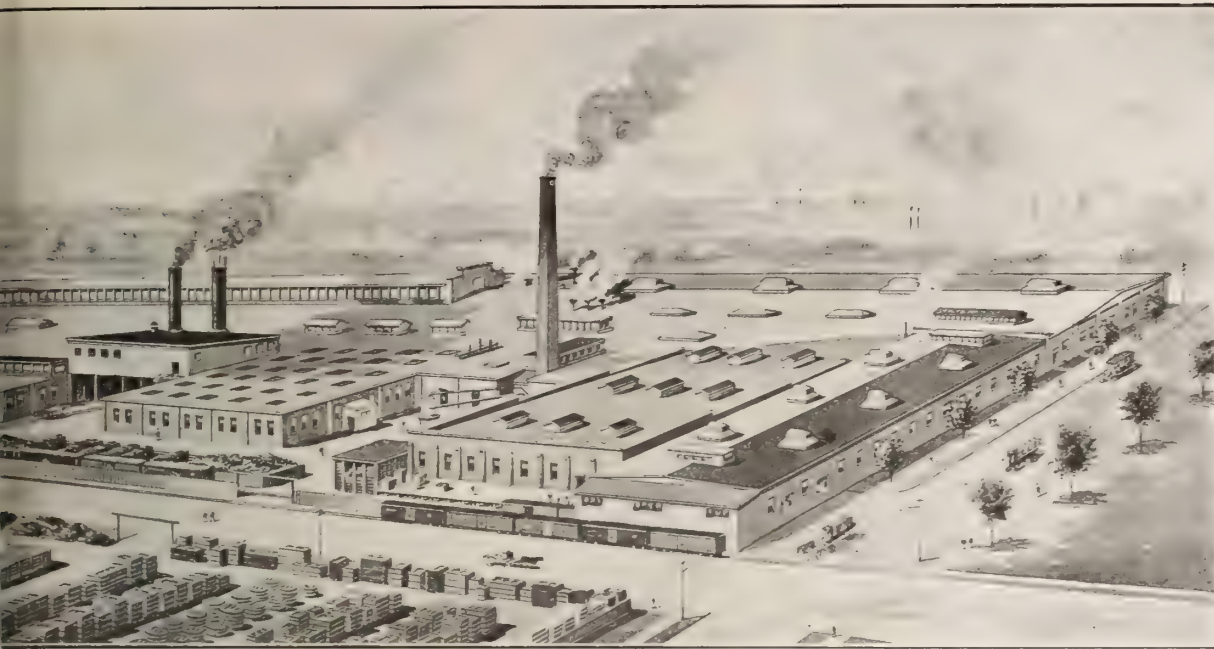
You know the quality of Gurney Goods variety of accessory—one quality runs through

We want you, who want service, to try to continue your patronage.

The Gurney Foundry Company, Limited



When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.



ULTS!

do it for you.

all that could be desired—Many a contractor

we've doubled our plant at West Toronto—
ndries in the *world* will mean better deliveries.
uch house points. We go into this fall with
in each of the buildings pictured here.

of men whose main object in life is to give

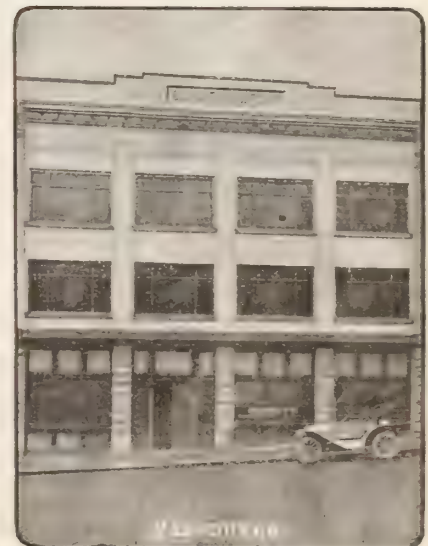
kind of boiler, every type of radiator—Every
all—the very best.

all—We'll give you every encouragement to



Toronto and West Toronto

Montreal Hamilton Winnipeg Vancouver
Metals Limited—Calgary, Edmonton, Lethbridge



"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."



1. Ed. Needham, wife and son; 2. H. Ruddick, wife and "Snookums"; 3. Needham and Son; 4. "Snookums Jugged"; 5. Male Suffragettes; 6. Fullerton Smythe and Crew.

TRADE NOTES.

Roche & Frere, plumbers, Montreal, have been registered.

H. G. Hagen, Amherst, N.S., plumbers, have suffered loss by fire.

Tube and Pipe Bending Co., of Ontario, Ltd., Toronto, have been incorporated.

The Provincial Health Inspector seems to have opened the eyes of the Board of Health of Woodstock. They now seem to realize that a sanitary inspector is a necessary commodity. Let's hope they get a good one, and there will be something doing there soon.

The Galt Brass Manufacturing Co., Ltd., Galt, Ontario, are enlarging their plant considerably. The steady increased demand for their goods renders this step absolutely necessary.

They anticipate this addition to cost about \$10,000 in round figures.

The new head office of the Bank of Toronto have an up-to-date vacuum cleaner as part of their equipment. It is driven by a 7½ h.p. electric motor.

The vacuum cleaner was supplied by The Spencer Turbine Cleaner Co., of Hartford, U.S.A.; the motor by The Canadian General Electric Co.

Sarnia is having trouble with her

water supply and an endeavor to secure the services of expert divers to examine the water works intake pipe is being made. Several cases of typhoid have been reported, and the tests of water have proved that it is seriously contaminated. It is to be hoped the trouble will be located at an early date as such conditions often lead to loss of life.

Medicine Hat to Have New Industry.

A large building for the manufacture of pumps and brass goods is about to be erected for The Medicine Hat Pump and Brass Co., Ltd. This company recently acquired their charter with a capital stock of \$50,000.

Considerable high-grade machinery and general equipment will be required.

The Sault Threatened with Typhoid Epidemic.

Sault Ste Marie, Ontario. — The city is threatened with an epidemic of typhoid fever and recently ten more cases have been reported to the medical health officer.

Crown Attorney Martin is taking action against the Tagona Water and Light Company for alleged non-compliance of orders of the provincial office issued three weeks ago that a chlorination plant be installed forthwith.

Owing to dredging operations alongside of the regular intake the company reverted to the old intake at the head of the ship canal and it is claimed that the water is contaminated from sewage of passing vessels. No notice was given by the company that a change of intake was being made. There are now 20 cases of typhoid.

Plan Gravity Pipe Line Water System.

A pipe line forty-four miles long to bring water for the citizens of Calgary from a spot high in the foothills of the Rocky Mountains is the plan which has been drafted out by A. W. Ellson Fawkes, waterworks engineer of this city.

At present Calgary gets pure, ice cold water from the Elbow river, the intake being situated about twelve miles west of the city. The new plan is to go thirty miles further up the river and build a gravity line which will do away with the necessity of pumping, either for fire fighting or any other purpose.

It is expected that the plan will cost over a million dollars, but the great pressure that will be obtained will prove a big saving in the long run as the maintenance cost will be small once the pipe line is built.

ANALYSIS OF CANADIAN SANITARY BY-LAWS.

(Continued from page 13.)

Clause 11 is a very agreeable clause, which does not the back-venting of all traps, but allows approved vents and non-syphonable traps where advisable, and quoting the clause which reads as follows:—Clause 11:

Approved automatic vents or non-syphonable traps may be substituted when necessary or advisable.

Clause 12:

No safe waste, range boiler or cistern overflow shall be allowed to connect with the drain.

Clause 13:

All rain water leaders from eaves shall be trapped when connected with the outside drain.

Clause 14:

Where roof water is conducted through the interior of the building, not less than medium soil pipe shall be used, and such pipe shall be connected with the hopper by a brass ferrule. Rain water leaders must not be used as vents of any fixtures.

Clauses 11, 12, 13 and 14 are all good clauses; and in clause 11 it is left to the discretion of the plumbing inspector, which in the case of Ottawa. He is a first-class mechanic himself. None could complain at the way the public are being safeguarded by this official. It is to be regretted that all cities cannot see eye to eye by appointing a man such as Ottawa has—one who has had a wide experience, and can weigh up the pros. and cons. of a job as well as the best.

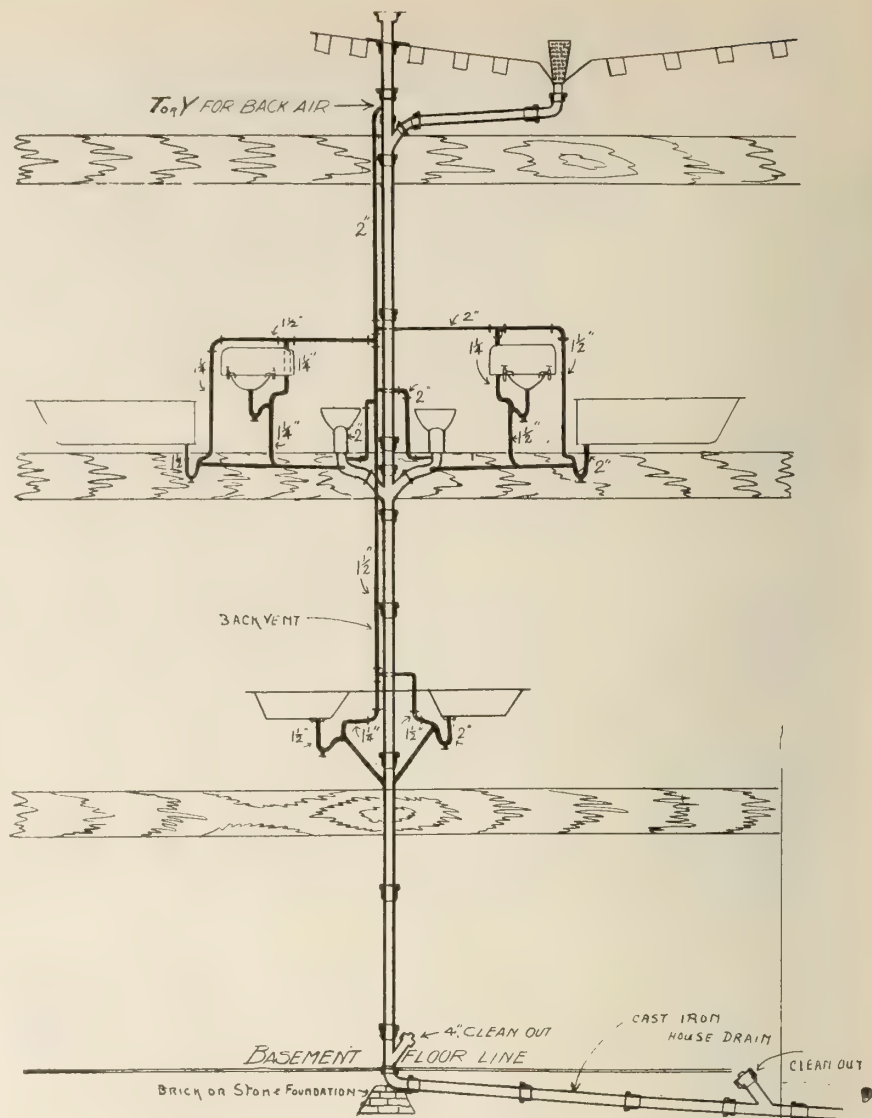
The balance of section 1 is general.

Section 7:

Before proceeding to construct, reconstruct or alter any portion of the drainage or ventilation of any house or building, the owner or his agent shall notify the health officer; and no master plumber, plumber or workman engaged by the owner of the building to construct, reconstruct or alter any portion of the drainage or ventilation thereof, shall do any work in connection with such construction, reconstruction or alteration, at or upon any such building until such master plumber, plumber or workman has satisfied himself that the owner has filed such notice with the medical health officer.

While this clause is a very good one, we hope it will be carried out to the letter. We only hope it is.

There is no doubt that if it was enforced and a permit was presented to the plumber who happened to be chosen



One of 6 charts which the Ottawa Health Office supply to the Sanitary Engineers. Fig. 2 shows double bath-room piping where 2 Houses are side by side.

quaint the health department before any work was started; and, further, it would be a protection to the public as well as those installing it.

In some cities many a job is done at night by workmen engaged in the trade and by handy men, whereas if this clause could be enforced making it a criminal act, first on the part of owners; second, on the part of those who do the work, and one or two prosecutions took place, this would settle the matter. Further, if a larger number of inspectors were engaged this matter could be taken care of in this way.

For instance, all sanitary conveniences should be inspected once a year. If that was done and the man inspecting it was to make out a report as to the state, style and general layout of the installation in each house, then a year from that period another call was made, this inspector could consult the report and see if all was just the same as was a

year previous, and in case there had been some work done which came under clause 7 he could ask for the permit, upon him not being able to procure one showing who had done the work, etc. The offenders could be arraigned before a court and fined. It would solve this work being done by irresponsible men, and bring sanitary matters to a higher standard, and at the same time any leaks found in the houses could be reported, which would result in a great saving in water.

It is rather to be regretted that there is no stringent by-law governing those who should be allowed to install this sanitary engineering. In Ottawa anyone can get a license, and anyone is allowed to install plumbing who can get the work in in some style or other. A board of examiners should be appointed, such as was referred to in our last issue in this series. None should be allowed to work at the trade unless they could

pass a certain examination as to their practical knowledge. The public would then get better value for the money they pay.

Another fine feature in the Ottawa by-laws is that a set of data sheets can be procured free on applying for same, which shows just how the provisions of the by-laws can be carried out. These are very valuable, and each city should have them in connection with their sanitary ordinances, one of which we have pleasure in reproducing for the benefit of our readers. There are several other clauses embodied in the Ottawa by-laws, which are of a general nature.

Practical Chats.

Price cutting is one of the mediums whereby a man is apt to lower the standard of his work or products to meet his competitor's price.

Prehistoric Baths.

Near a little town called Schull, on the south coast of Ireland, and located in a very wild spot, a prehistoric bath has been discovered by James Buckley, Esq., a member of the Royal Irish Academy. There are several to be found, but this one is in a very fine state of preservation, and measures 10 ft. by 9 ft., and does not look unlike an ordinary lime kiln. These baths are known by the name of "Sweating Holes."

Only Trained Men Should be Allowed to Engage in the Business.

In his quarterly report Dr. George G. Melvin, of St. John, New Brunswick, medical health officer, recommended that all sanitary engineers should first pass a thorough examination before being granted a license to engage in the trade. He pointed out that conditions made it necessary.

"Sanitary Engineer" has been advocating such a system for some time, and hopes to see it a concrete fact e'er long.

It is only by such methods that our sanitary engineering can be put on to a higher plane. Many a city and town have such a clause as make it necessary for a man to take out a license. But anybody can get a license, and that is the trouble; they are just paper by-laws and not put into practice.

Everybody Allowed to Poison Air We Breathe.

No one was poisoned, no one became ill, as far as we know; but we do know thousands of cases of tuberculosis are being generated by poisoned air in our

homes and places of business by lack of proper ventilation, and there is not even a mild protest against the practice.

We can refrain from buying such commodities which are APT to be adulterated, but we must breathe. Hence there should be stringent laws brought into force to be a part of our building laws. Here's a change for a little publicity for the sanitary, heating and ventilating engineer. No home is sanitary which is not properly ventilated.

TO READERS—

We repeatedly ask our readers to send in any good wrinkle or kink they pick up through their daily experiences, and we know every one who are studying and practicing the trade know lots of good ones. We can write them up by the load, but we wish our readers to become interested in this series of "Shop Notes." They would then be bound to be of more value to each and every one, for instance, how many of our readers can describe the correct method of connecting up a right and left coupling without putting more strain on one side than the other. That is just an instance. So let us see more interest taken in these columns.

Further we wish your comments on any article you read, by so doing we find the amount of interest our readers have in the paper. It is the only Canadian publication which is interested in Sanitary and Heating problems.

EQUIPMENTS TOO SMALL.

Several towns who have been up-to-date on principle as regards sewage disposal have lacked foresight as far as taking care of quantity of sewage to be handled. It is too bad such towns do not take the matter up a little more thoroughly by consulting an expert engineer, or in most cases take the advice of their own engineer. He will often advise a large enough system, because, first, he knows one a little large will handle the quantities easier than a system only just large enough. Then, again, his reputation is at stake, which is to be considered from his own standpoint. We find Stratford in such a position to-day, which, to say the least, is very disagreeable; but find that Provincial Engineer Dallyn, after an inspection of the plant recently, inti-

mated that his report to the board will recommend the following improvements:—New sedimentation beds and improved sprinkling equipment, including an auxiliary gas engine; a chlorination device, and a humus bed between the sprays and the creek into which the purified effluent empties.

Mayor Greenwood promised prompt action in the matter.

Galt, too, we believe, should take notice if they wish to keep on easy street.

HOW MANY SANITARY ENGINEERS HAVE A SIGN LIKE THIS IN THEIR STORE?

SPECIAL
attention given to
remodelling defective work.
SMOKE TEST APPLIED
to drains and plumbing
which will find out
DEFECTIVE WORK
and
PREVENT DISEASE
in houses.

New Companies.

Under "the Companies Act" letters patent have been granted under the Seal of Secretary of State of Canada, bearing the date of 20th August, 1913, incorporating Lyman Elliott Moulton and Joseph Armand Cousineau, contractors, Hugh McGuire Wamboldt, foreman steamfitter and Alexander John Le Moine, sprinkler engineer of the City of Montreal, in the Province of Quebec, and Louis Albert Lambskin, of St. Henri, in the said Province of Quebec, factory superintendent, for the following purposes, viz.: To do business as general piping and plumbing contractors and also manufacturers of piping appliances.

The operations of the company to be carried on throughout the Dominion of Canada and elsewhere by the name of "L. E. Moulton & Co., Ltd." with a capital stock of \$50,000.00, divided into 500 shares of one hundred dollars each, and the chief place of business of the company to be at the City of Montreal, Province of Quebec.

Dated at the office of the Secretary of State of Canada this 22nd day of August, 1913.

THOMAS MULVEY,
Under Secretary of State.

TRADE NOTES.

John McLaren, the worthy manager of the Galt Brass Manufacturing Co., Ltd., of Galt, Ont., is on business and pleasure bent in the Maritime Provinces.

The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.

A vacuo-vapor system of heating is a low pressure of steam, viz. a steam system with less than 2-lb. pressure at the boiler.

It has no complicated mechanical parts in its construction. It circulates steam through every radiator at extremely low pressure and does not require any air valves on the radiators. Thus dispensing with the necessity of continually opening or closing of the air valves as is often required on either a one-pipe system or on an ordinary old style plan of steam heating. These vacuo-vapor systems, too, if properly installed are absolutely noiseless. Further, a vacuo-vapor system can be successfully operated at almost any pressure ranging between 1 lb. pressure or less, and up to 10 lbs. No system will operate with less personal attention than a properly installed vacuo-vapor system of steam heat. This system along with a good thermostatic temperature control would be about the most ideal heating plant that could be desired and is applicable to either large or small residences or factory or office buildings.

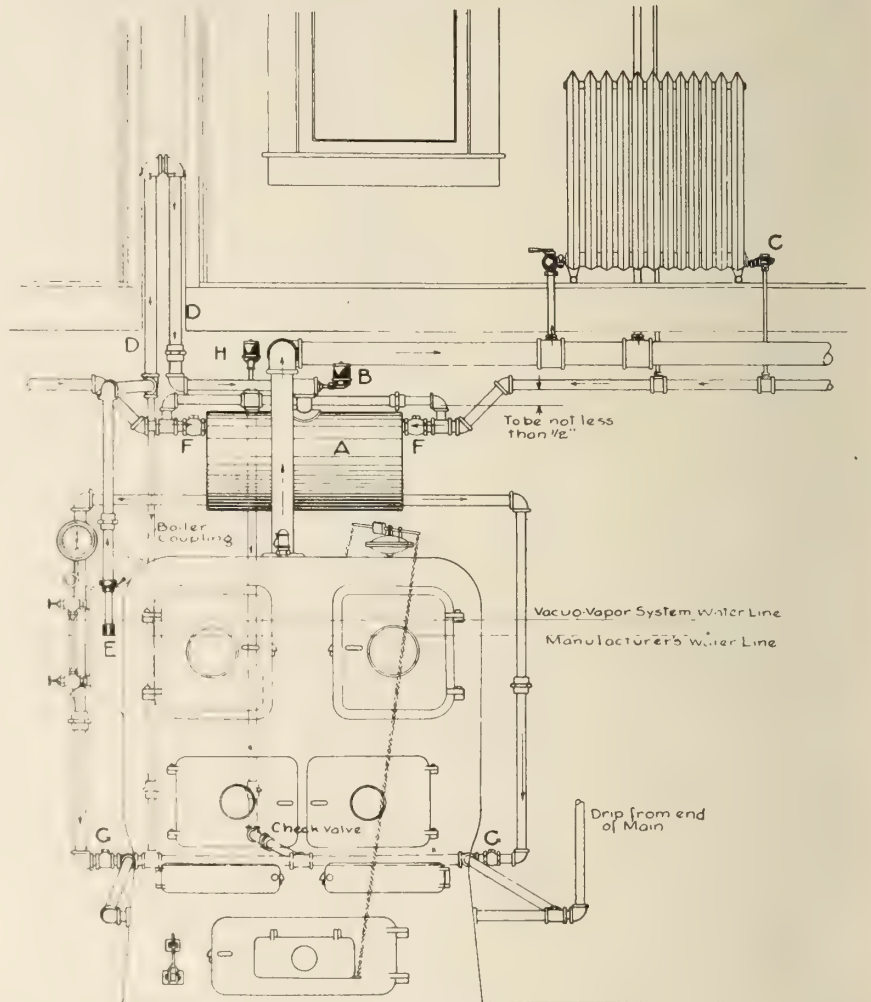
We have been able to reproduce a very popular plan of a vacuo-vapor system along with the description of same. Fig. 1.

Steam having been generated in the boiler flows through the mains into the radiators, driving all the air ahead of it through the radiator trap "C," into the return line, thence to the receiver "A," from which it escapes to the atmosphere through an automatic air valve "B."

The steam in the radiator following the air closes the radiator trap "C," and is held in the radiator and kept from escaping into the return line.

As the steam in the radiator condenses, the condensation flows into the trap "C," which opens to discharge it into the return pipe, from there it flows into receiver "A" as soon as the condensation flows out of trap "C" steam flows in and the trap immediately closes.

The same process continues in all radiators and the condensation collects in the receiving tank.



We will again ask our readers to follow us in describing Fig. 1, starting at "D," which is the equalizing tube and extends down into the boiler below the water line, and looping above the boiler dropping down to the top of the receiving tank "A." This tube keeps the pressure in the boiler from communicating itself to tank "A," until the water of condensation has accumulated in tank "A" in such a quantity as to lower water in the boiler below the equalizing tube bell "E."

At this moment the steam from the boiler rushes up through the equalizing tube "D," and into the tank "A," im-

mediately closing the automatic air valve "B," also check valves "F." When the pressure in tank "A" becomes the same as that in the boiler the water in tank "A" returns into the boiler by gravity through the check valves "G." noted at the bottom of the boiler.

The water thus flowing from the tank into the boiler immediately raises the water in the boiler sufficiently to re-seal the equalizing tube "D," and leaving the receiving tank "A" full of steam. This steam then condenses and forms a suction of varying degrees throughout the return lines.

The air valve "H" is installed for the purpose of permitting the air to escape from the system when the tank and boiler are equalizing. This equalizing tube "D" can be connected to the boiler from any convenient tapping which will allow the send tube to enter into the boiler in just the same way as a tube in a range boiler.

There is always sufficient difference between the steam in the radiators and the return line to keep the radiators freed of condensation and air.

Better conditions could not be desired than that the steam should be allowed to enter the radiators exactly in the same proportions as is necessary by the rapidity of the condensation which is taking place therein.

The fact that it is a sealed system makes it possible to produce steam in the boiler under vacuum conditions, thus utilizing the vapor produced by the heat arising from a banked fire.

It will be seen also by the plan Fig. 1 that the system is a regular two-pipe system requiring no air valves on the radiators and the piping is installed similar to a system with dry returns.

And in case any of our readers would like more specific data regarding the principles of vapor heating they would do well by writing to any of the following firms who are manufacturers of certain specialties which go to make up some of the finest systems in the world:—Messrs. C. A. Dunham & Co., Ltd., C.P.R. Buildings, Toronto; Darling Bros., Ltd., Montreal; Mouat Squires Co., Ltd., of Cleveland, Ohio, U.S.A.; National Steam Specialty Co., Ltd.

PIPE COIL OR WALL RADIATION.

Editor of the Sanitary Engineer. — In the case of a large manufactory would it be better to use coils made of common black pipe, or would wall radiation be better?—J. B. Collins.

We should judge that it would depend upon the amount of space to be heated and also the room available to instal the coils or wall radiation, as the case might be. One of the largest institutions we know of, a place where some 15,000 employees must be kept warm, employs nothing but wall radiation in its buildings that have been erected during the past five years. Another institution which employs about 10,000 hands uses nothing but coils made of pipe for heating. In each of these instances the governing point was the manner in which the radiation had to be located so as to get certain results. As to liability from leaks, etc., any steam or hot water apparatus that is not carefully and honestly installed is liable to leak—and some-

times on the most conscientiously erected work the leaks will happen.—Editor.

VELOCITY THROUGH THE STEAM MAINS.

Editor of the Sanitary Engineer. —

Will you kindly show and explain the speed at which steam passes through a steam main at a pressure of from one to three pounds?—P. J. Weiss.

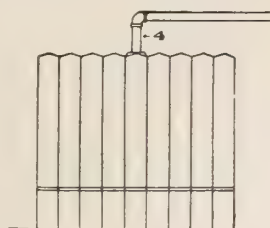


Fig. 1.

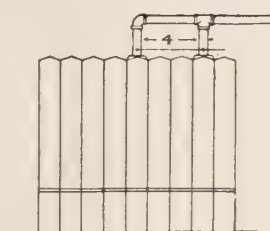


Fig. 2.

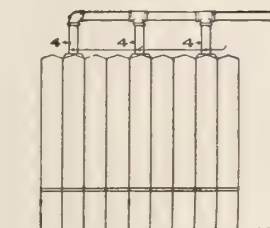


Fig. 3.

As you increase the number of openings in the steam dome, you decrease the speed of the steam. In fig 1, with a 4-in. opening and a steam pressure of 2 lbs., the velocity would be 45 feet per second. In Fig. 2, same conditions the velocity would be about 22 and a half feet per second. While in Fig. 3 the velocity would be 15 feet per second for each outlet. A steadier water line will be obtained from Fig. 2 or 3 than from Fig. 1, under the same general conditions.—Editor.

WATER PRESSURE IN THE HEATING JOB.

Editor of the Sanitary Engineer. — The expansion tank is located 28 feet above the boiler. Now can you tell me how much pressure that would put on the boiler and mains? How do you figure it anyhow?—P. R. McSnall.

It is said that one foot of water (in height) will give .43 of pressure per square inch. Therefore, if your tank is 28 feet above the boiler, you would

have a trifle over 12 lbs. pressure, or to be exact 12.04. This is one thing that makes an ordinary hot water job so much more liable to leak than an ordinary steam job. THERE IS MORE PRESSURE. The fitter, many times, does not think of this and hence gets several leaks on hot water work where, had he used a little more care, he would have had but few. The best way is to test the job thoroughly in sections with city water pressure—at anywhere from 40 to 90 lbs. pressure—Especially on concealed work is the last suggestion recommended.—Editor.

ALTITUDE A FACTOR.

Editor of the Sanitary Engineer. — When I lived in the east, near the sea coast I noticed that it took quite a bit of fire to raise steam in the heating boilers. Now I am living in a town about a mile higher up I can see a great difference in the coal burned and also the time required to get up steam. Please explain.—"Heater."

The altitude of a place cuts the figure in this case. The steam is generated at a less temperature and so much coal is not needed, nor time.—Editor.

DRAWING DOWN THE CHIMNEY.

Editor of the Sanitary Engineer. — One of my customers has an idea that he would run tile down his chimney and make a round, instead of a square chimney. He says "it works easier." Would you advise the change?—John Rauser.

He is right about the chimney working easier. Care must be taken, however, to see that, in putting in the tile, you do not make it too small for the amount of cubic inches in the smoke pipe of the boiler.—Editor.

NEW GARBAGE BURNER FOR TORONTO.

Toronto is to have one of the finest garbage burners it is possible to procure and men are busy now with the foundations necessary. This is a very commendable move, and one which every town or city, large or small, should make. At the present date very few dispose of garbage but merely move it from one place to another, which is very often a very serious inconvenience to those in the vicinity of "The Dump." There are also individual garbage burners to be had which are a very good acquisition in the home. They are built something after the style of a furnace and in many cases are used to supply hot water for domestic purposes.

PATTERN FOR 2, 3, AND 4 PIECE ELBOWS.

Editor, Sanitary Engineer.—Would you kindly inform me through the columns of "Sanitary Engineer" how to draw patterns for a three and four-piece elbow? I might say that I have been able to learn considerable from your course in sheet metal work, and hope you will continue the same.—C. H. A. Estevan, Sask.

This information was given in one of the early problems, but we have pleasure in reproducing the same, along with patterns for four sizes of elbows, viz., 2, 3, 4 and 5 inches.

We will develop the pattern for a two-piece elbow, as shown in problem 1, plate 11.

We will say the elbow is for a 3-inch pipe. The size of pipe, however, makes no difference, as the principles involved

are the same, whatever size is being developed, either round or elliptical.

Draw a circle 3 in. diameter. This represents the plan. See Fig. 1. Above the plan, and in line with it draw the elevation, Fig. 2, which is really an outline drawing of the two-piece or mitre elbow, showing how it is constructed. It also shows that it is a 90 degree two-piece elbow.

The spaces A B and D E must be the same width as the diameter of the circle, viz., 3 inches.

Draw the line F C, which is the mitre line or joint, off to one side, and in line with A B draw a line H H, which represents the stretch-out line.

Now with the dividers step off one-half of the plan, Fig. 1, into numbers of equal spaces (in this case 6) and number each point 1, 2, 3, 4, etc., as shown.

It is only necessary to space off one-

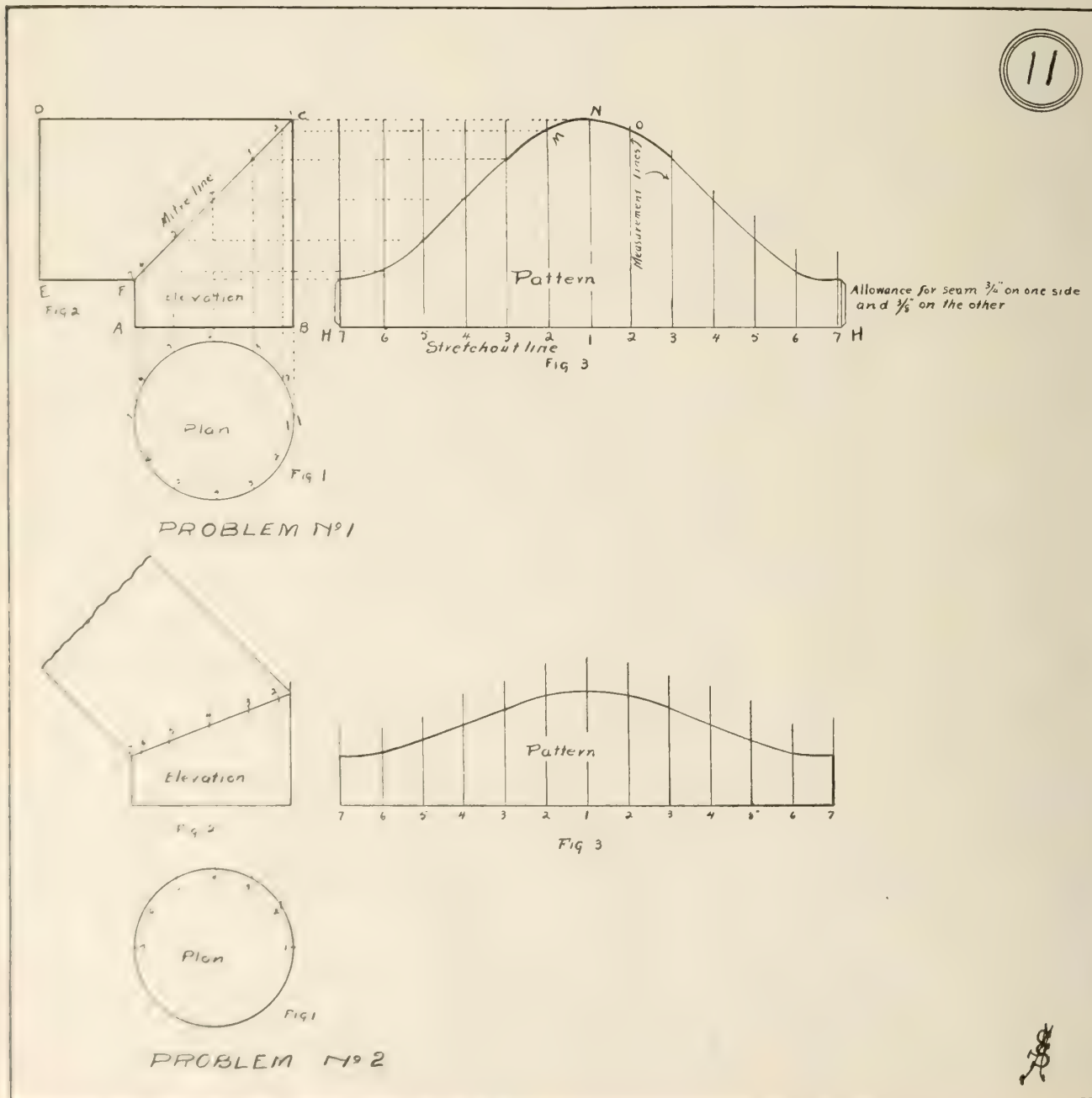
half of the circle, as both sides of the elbow mitre are the same.

Now transfer the spaces on the plan to the stretch-out line, H H. Transfer twice the number of spaces stepped off, or complete girth of the circle, and number these spaces same as on the plan.

Start with No. 1 in the centre and number each way. Draw the usual measurement line through each number.

Now return to Fig. 1, draw a dotted line from 7 on the plan to F on the elevation, or else place the T square parallel to the line B C, and carry each point on the plan to the mitre line, F C.

Then place the T square parallel to D C, and carry these points out to the corresponding measurement lines and make a mark through each. A line then traced through these points gives the desired pattern.



Problem 2.

Draw a square mitre for a 2 in. and 4 in. pipe. Problem 2 is another two-piece mitre, the only difference being that the elbow is at an angle of 45 degrees, instead of being at right angles. It will be noticed here that we do not draw the dotted lines from one point to another. We merely place the side of the T square against the number, and make a small stroke through the point we wish to cut, thereby saving time and making the work simpler.

Draw two patterns for elbows of different angles.

Let us now take problem 3, plate 12. This is a 3-piece elbow.

First draw the plan, Fig. 1; then the elevation, Fig. 2. The pattern for the parts A and B are developed the same

as explained in problem 1 and 2. So they need no further explanation.

What we want to know now is how to develop the pattern for the gore piece B.

Having drawn the plan and elevation, divide the plan into equal number of spaces and number each.

Carry lines to the mitre line B C and mitre line A D by drawing lines parallel to D C. Now draw the stretch-out line N M at right angles to the line D C.

Transfer the spaces from the plan to this line. Number same and draw the usual measurement lines.

Now place the T square or side of the triangle against the T square so that its edge will run parallel to the line N M, and carry each one of the points from the mitre lines A D and B C out to the

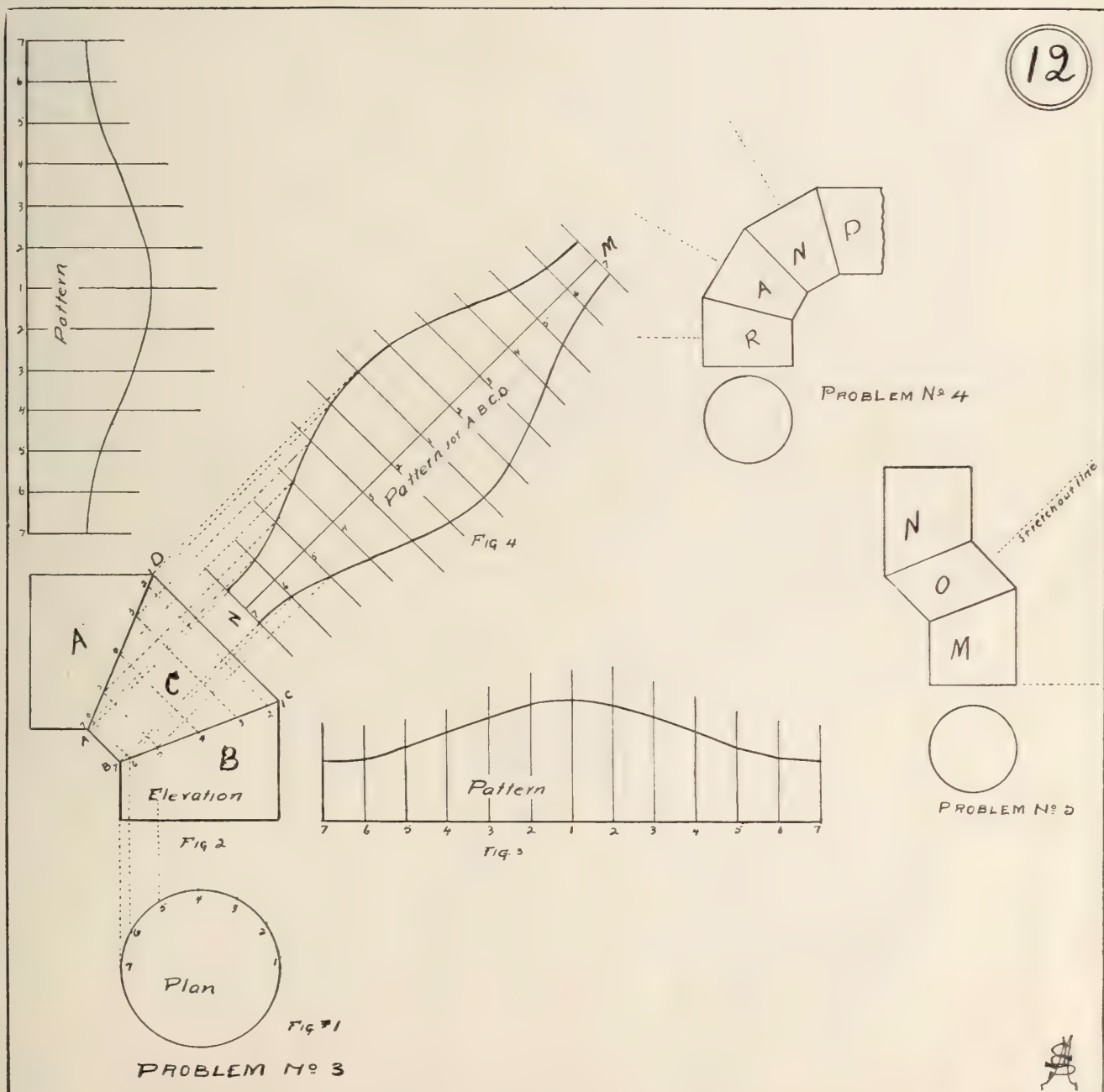
measurement lines having the corresponding number. A line traced through these points gives the desired pattern.

Draw a pattern for a three-piece elbow 4 inches in diameter.

Problem 4 shows a four-piece elbow. The end pieces R and D are developed the same as explained for problems 1 and 2.

The gore pieces A and N, as explained for problem 3, draw a four-piece elbow for a 3-inch pipe.

A very easy way to make an offset is to leave the seams of A and N, viz., the centre joint very loose, and by twisting these almost any desired offset can be got. When the desired offset has been fitted, mark the position and pene down so as to make it tight in the right direction. Editor.



Complete Course of Sheet Metal Work

By L. W. KOSER

(Continued from Aug. 1 issue.)

In the diagram of dotted lines, however, the one nearest the front S-K while being lower than the other is slightly larger than 6-G and 7-H, consequently it overlaps these two.

The method of getting these different heights will be explained as the problem proceeds.

Now let us first draw the plan, Fig. 1, by first drawing the circle or base the desired size.

Then draw the elliptical top off to one side, divide off one half of the base into any number of equal spaces, say eight, and letter each space as A-B-C, etc.

Divide one half of the ellipse into the same number of equal spaces and number them 1-2-3, etc.

Then draw full lines from A to 1-B to 2, etc.

Then draw in the dotted connecting lines from 1 to B, 2 to 3, etc.

Then draw the elevation R-S-1-9 directly over the plan making the line 1-9 to the desired pitch.

Extend the line R-S for the base of the triangles.

Erect the vertical lines K-M and J-N at any convenient place.

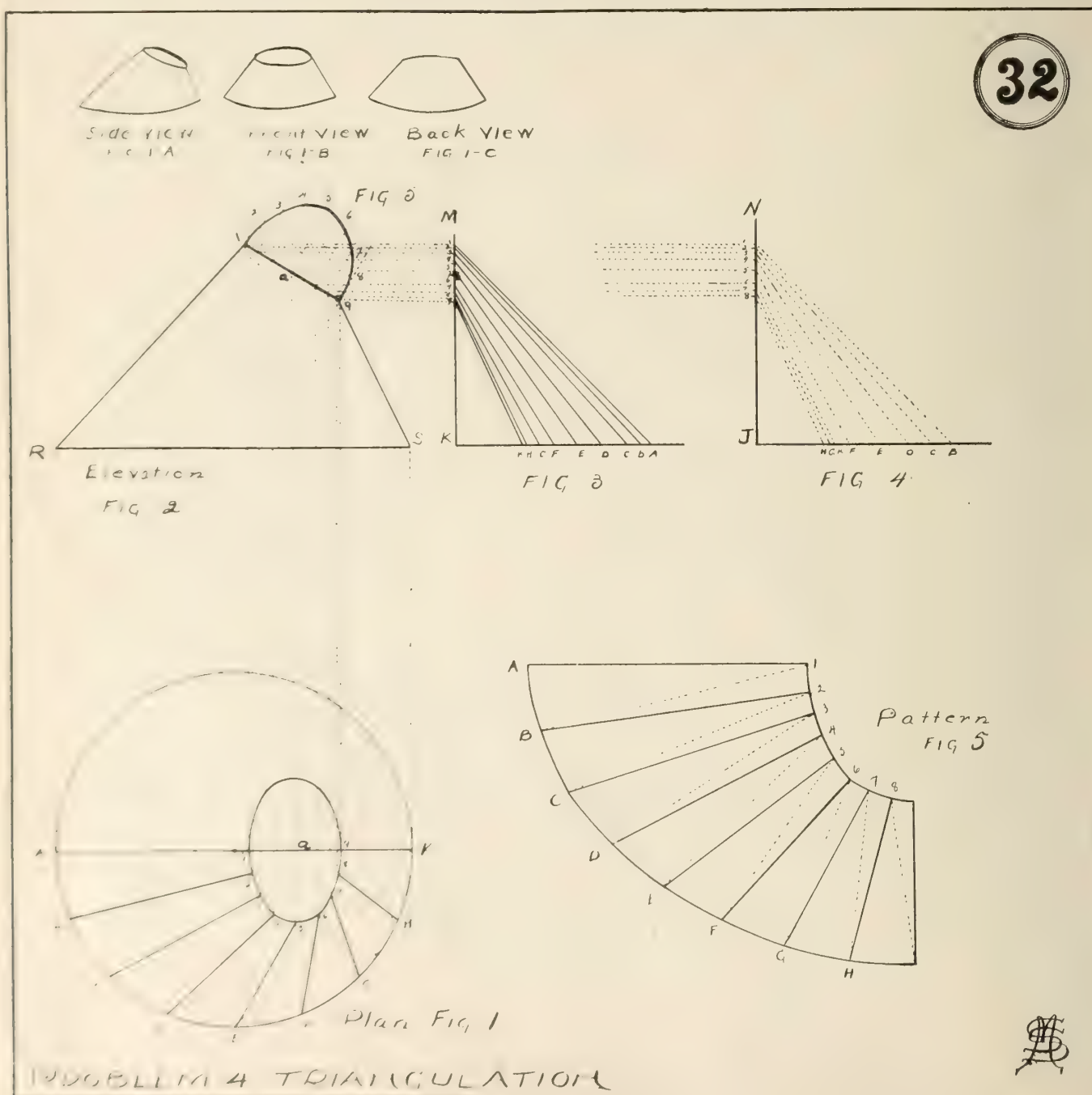
Now carry a dotted vertical line from

each of the points on the ellipse of plan to the line 1-9 of the elevation.

Then carry each of these lines horizontally from the point they meet on the line 1-9 to the vertical lines K-M and J-N which gives the height of each of the triangles.

Now lay off from K the spaces represented by the full lines of the plan and connect points A-1-B-2, etc.

Then lay off from J the spaces represented by the dotted lines on the plan as 1-B, 2-C, etc., and connect them with the numbers at the top the same as called from the plan as B-1, C-2, etc., observ-



ing that K-8 the last line, being longer than G-6 and H-7, overlaps these two.

Now to get the true size of the ellipse from each of the points on the line 1-9 of the elevation, Fig. 2, project a light or dotted line at right angles to the line 1-A.

Set off the space A-5, Fig. 5, the same as A-5 of the plan, Fig. 1, and each of the other spaces the same distance that the points on the plan are from the line 1-9 connecting these points, gives the true size of the ellipse and we use the spaces on Fig. 5 for the top when laying off our pattern.

As both sides of the pattern are the same in this case we only need to develop one half.

Now to develop the pattern we proceed as follows:—

Take the line A-1 of Fig. 3 and set it down as shown at Fig. 6.

Then set the compass to 1-B of Fig. 4 and with 1, Fig. 6, as centre swing an arc then with the compass set to A-B, Fig. 1, and A, Fig. 6, as centre locate the point B.

Then with B-2 of Fig. 3 and B as centre strike an arc near where point 2 should come on the pattern.

Then with the space 1-2 of Fig. 6 and 1 as centre locate point 2.

Then with the dotted line 2-C of Fig. 4 and 2, Fig. 6, as centre strike an arc and with the space B-C of Fig. 1 and B as centre locate C.

Then with C-3, Fig. 3, and C as centre strike an arc and with 2-3 of Fig. 5 and 2 of Fig. 6 as centre locate point 3.

Proceed in this manner until the pattern is developed.

On Plate 33 we show how to develop the patterns for a bath tub.

Fig. 1 is a side elevation.

Fig. 2 is a half plan view. Fig. 7 a correct plan of the top rim.

First draw the elevation, A-B, C-D, Fig. 1.

Then the horizontal line E-F and regarding this a centre line, draw one half of the plan C-H, I-J and K-L-M-N.

Divide the curve of the bottom M-N into any number of equal spaces and the curve of the top I-J into the same number of equal spaces.

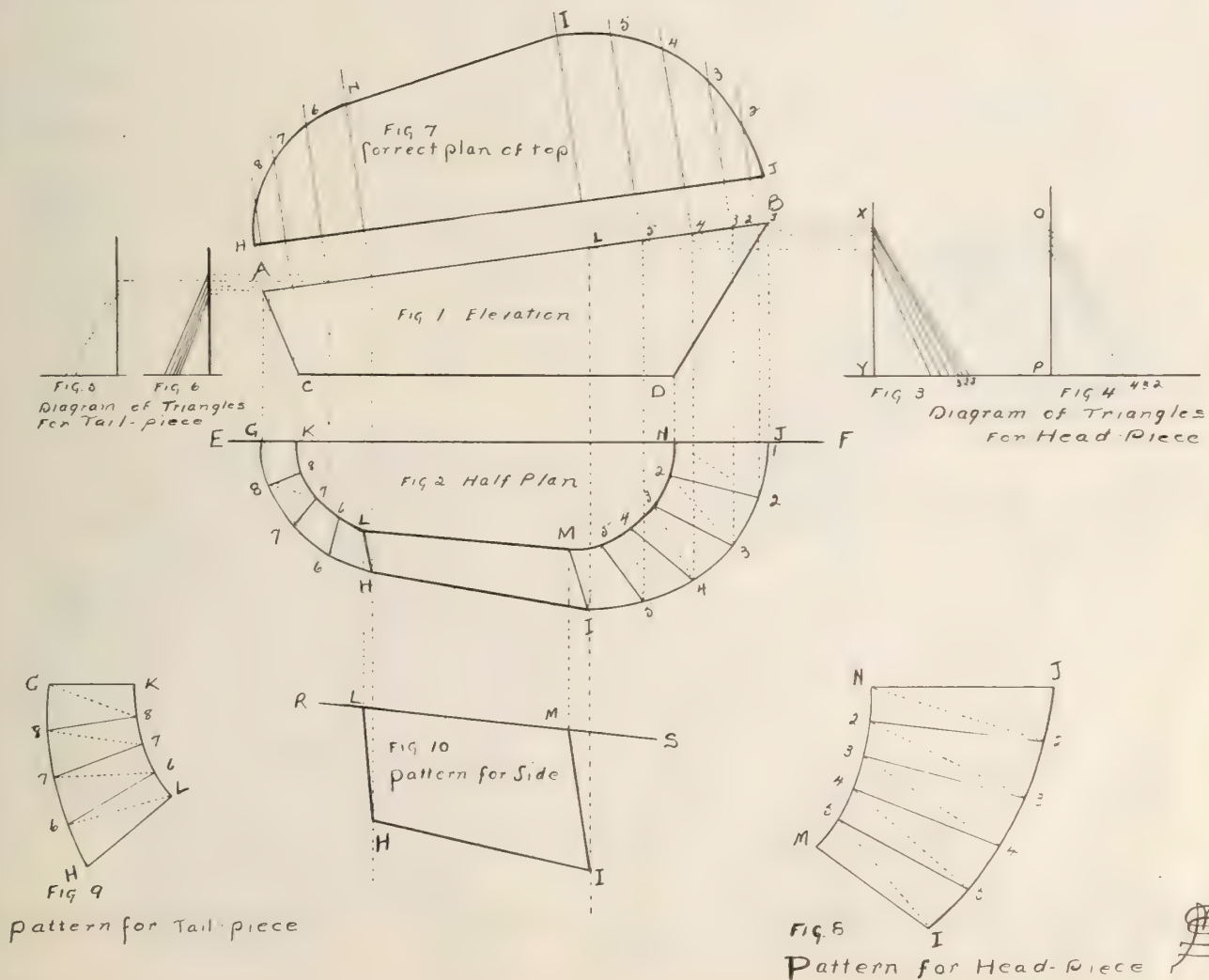
Connect them with heavy lines and draw dotted lines from the points on the inside lines to the next highest point on the outside lines.

Treat the tail piece the same way.

(To be continued.)

PATTERNS FOR BATH TUB

33



SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VII.

TORONTO, SEPTEMBER 2, 1913

No. 17

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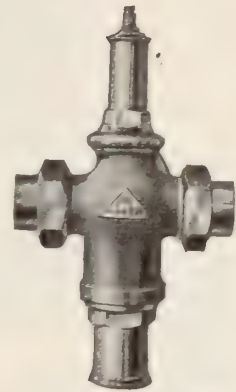
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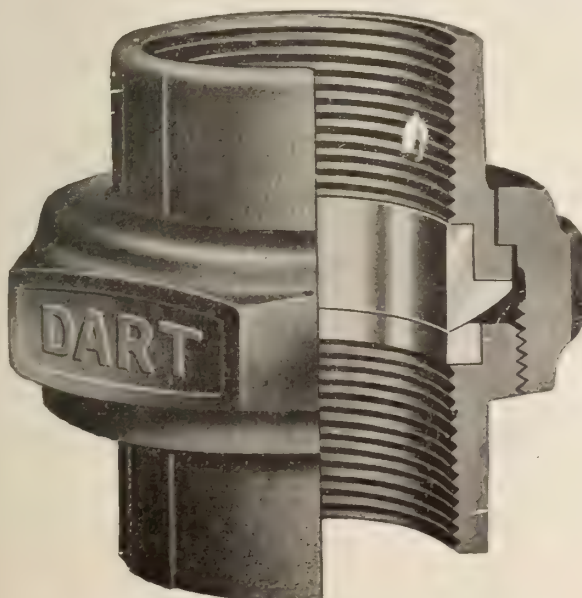
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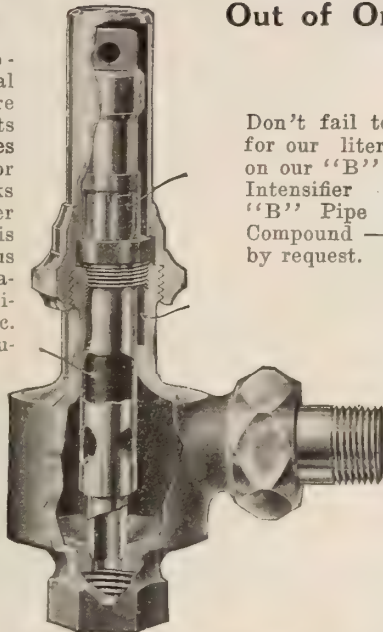
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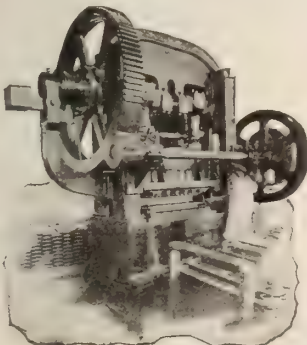
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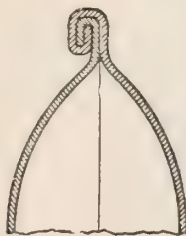
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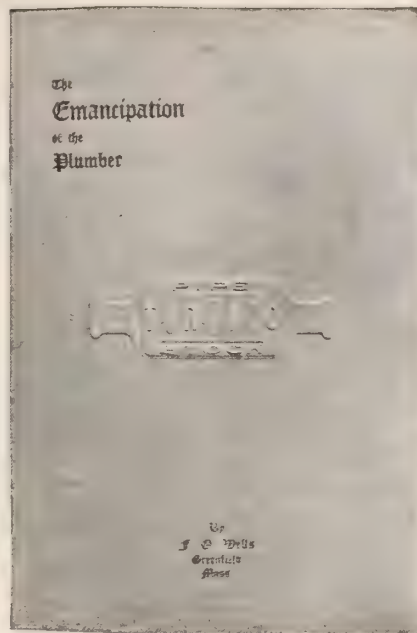


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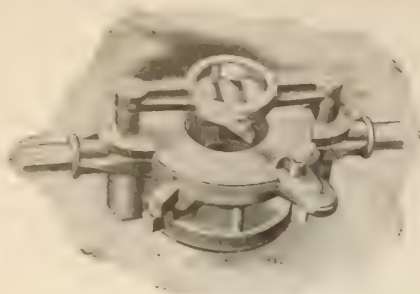
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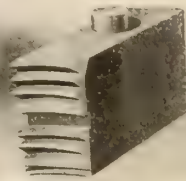
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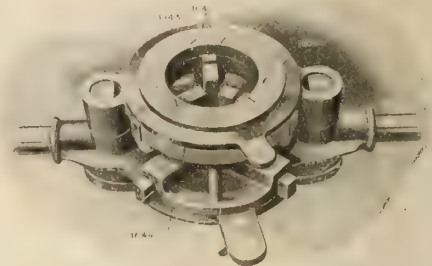
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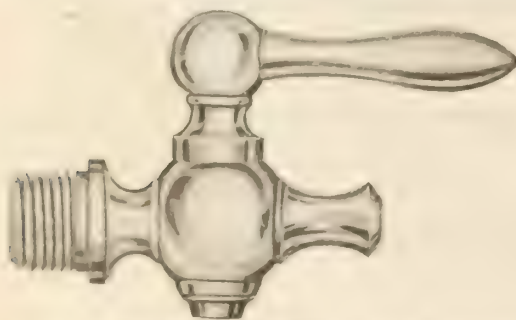
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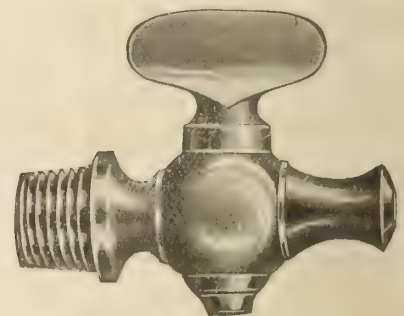
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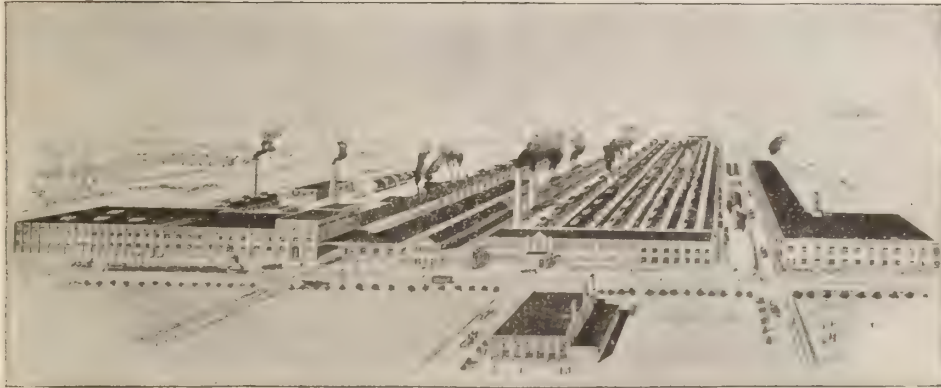
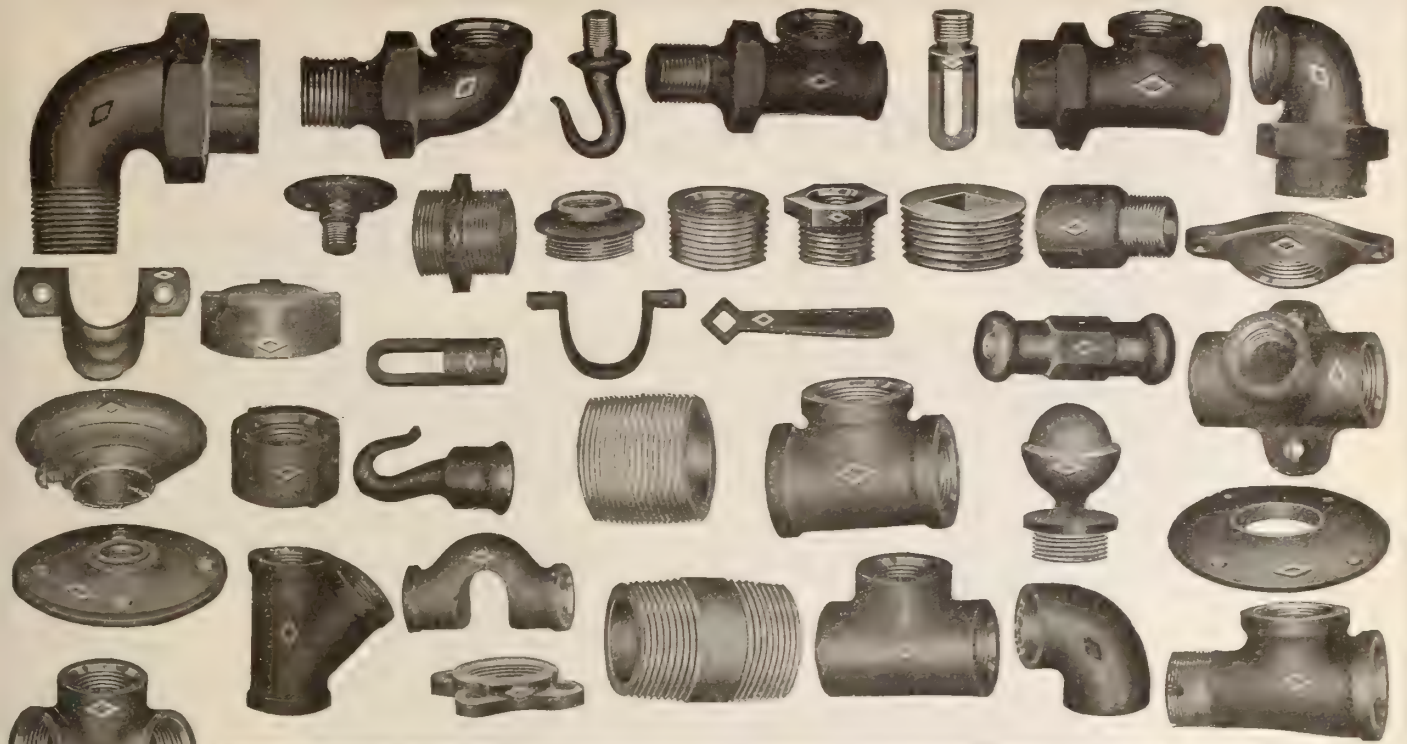
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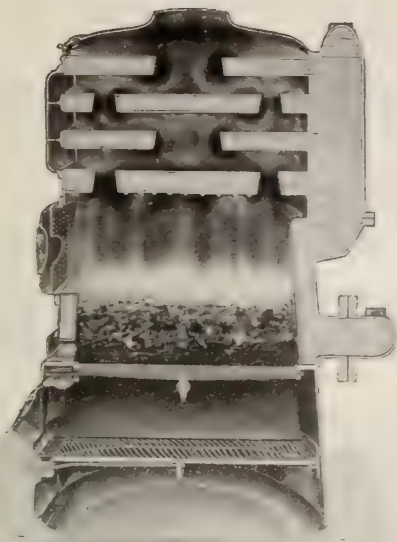
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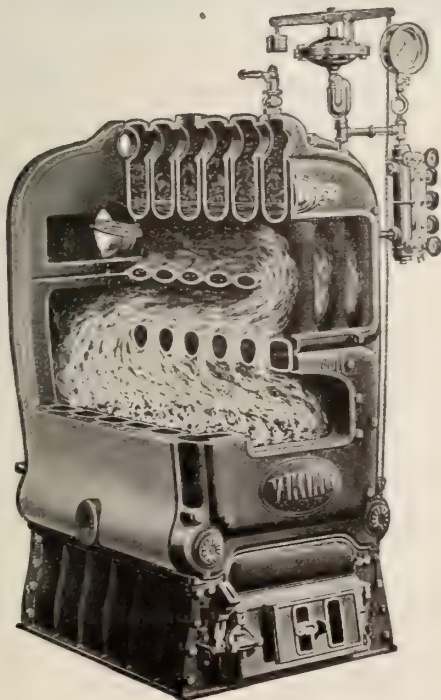


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We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



Our
"VIKING"
BOILERS

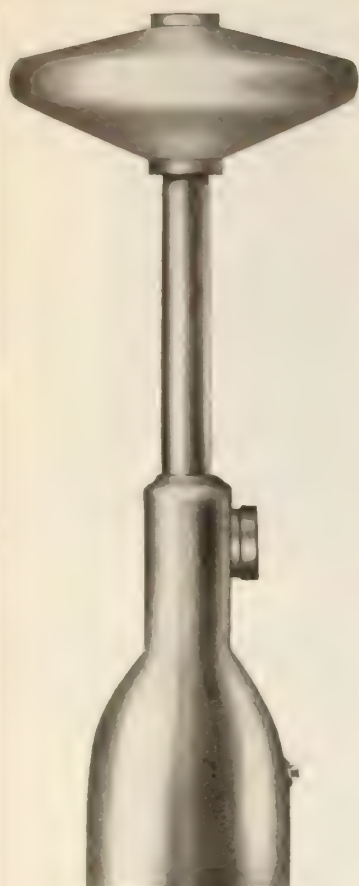
For STEAM or HOT WATER

Are Giving Great
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They are easily regulated
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THE HONEYWELL HEAT GENERATOR

*The Only Safe and Dependable Seal
for Hot Water Heating Systems*

Heating Contractors in Canada and United States, as well as in European countries, whose experience dates back for a few years, know that before the Honeywell Heat Generator was invented and placed on the market, Hot Water Heating plants were rarely sealed with any device to produce pressure on the water, above that caused by static head.

When hot water first came into vogue for house heating in England, the Heating Engineers used mechanical valves to some extent, but the practice soon died out, because of disappointment or disaster following the use of mechanical devices.

For almost half a century systems commonly called open systems were used by Heating Engineers in Canada and United States, and these systems continued in favor until the Honeywell Heat Generator—the only absolutely dependable mercury seal—was introduced. It “**must**” have filled a long felt want. Since its advent, more than 132,000 have been sold, and are in use, giving satisfactory service in every country where Hot Water Heating is used.

The intelligent Canadian Heating Engineers can be safely trusted in discriminating between the Honeywell Generator, with the reputation, and the irresponsible mechanical valves offered as make-shifts.

Honeywell Heating Specialty Co.

Wabash, Indiana

FRANK T. RAWLEY, Canadian Manager, Room 1008, Eastern Townships Bank Bldg., Montreal. Phone Main 4615

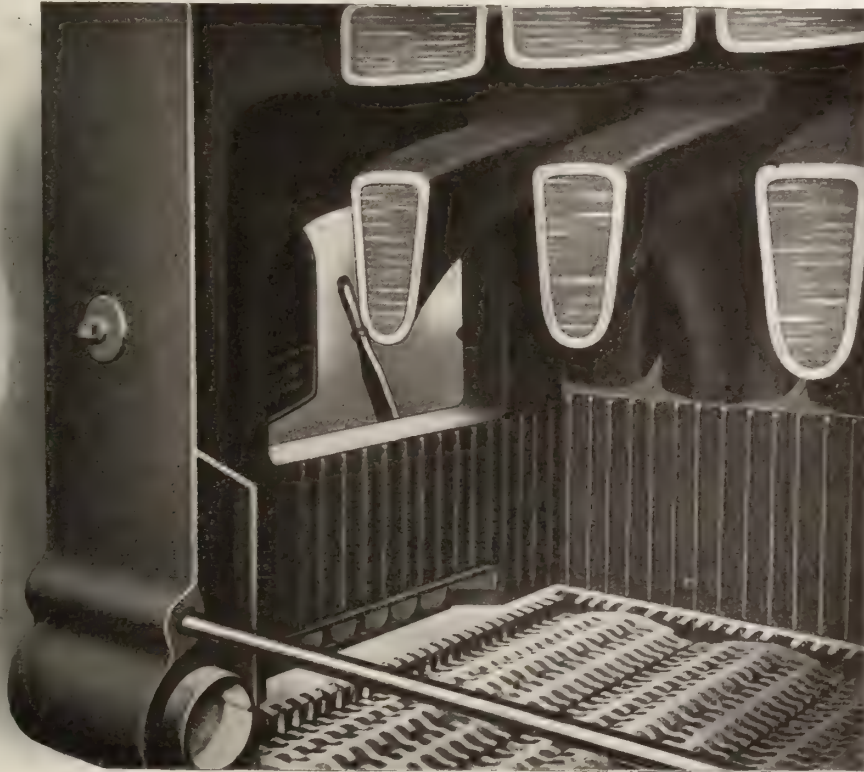
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Here is a Picture that Tells its Own Story

The wise heating contractor uses our 900 series Sectional Boilers and the reasons are right in sight.

The water ways in this boiler break the water into small, thin divisions—
The result is quick!



No need to argue about that deep fire-pot—You know its best from experience — with round boilers, and your customers will bless you when they find it means fewer trips to the cellar.

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YOUR COST

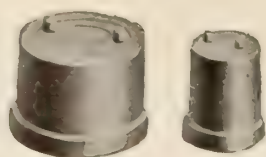
These sections are machined in such a way that your gang will be back from the job hours sooner than with any other boiler — It is the easiest boiler in Canada to erect.

Everything you need for a heating job, Mr. Contractor, is in stock at a point convenient to you—and a lot of fellows behind those big stakes who give service.

The Gurney Foundry Co., Limited

TORONTO AND WEST TORONTO

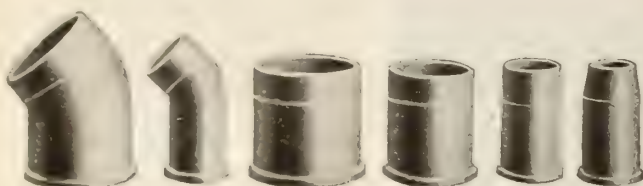
MONTREAL HAMILTON WINNIPEG VANCOUVER
METALS LIMITED, CALGARY, EDMONTON, LETHBRIDGE



Cleanouts, Iron Body, Brass Tops



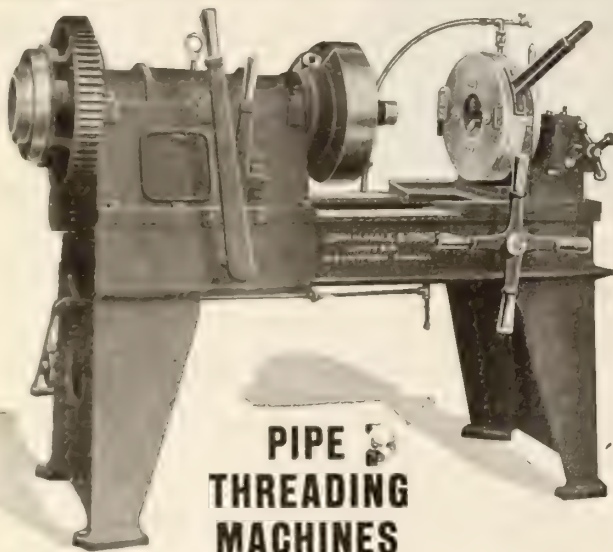
Brass Nipples, Male and Female



Brass Ferrules, Standard and Heavy

Tallman's Reputation is in the Goods

Tallman Brass & Metal Co.
HAMILTON, ONT.



**PIPE
THREADING
MACHINES**

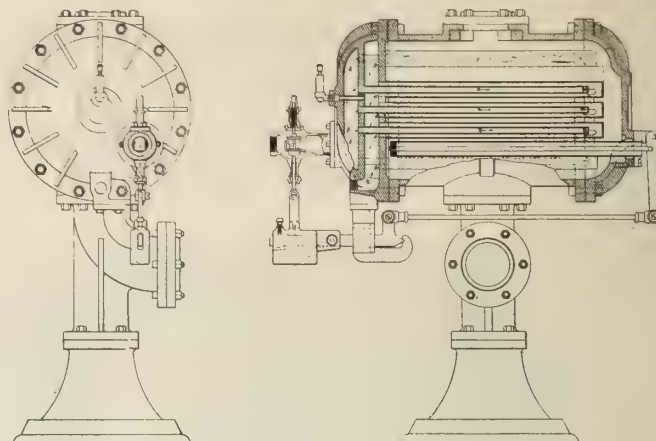
Made in Canada

of the best material and by skilled mechanics, some of them of superior ability, having worked several years on this line in some of the best factories in the United States. Our machines have been in successful operation in all the Pipe Mills, and many of the best Plumbing and Steamfitting businesses in the Dominion for years, and for the above reasons, we believe we can satisfy YOU. We are there with the goods. References cheerfully given. Write us for catalogue.

JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

The "Manny" Heater

Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



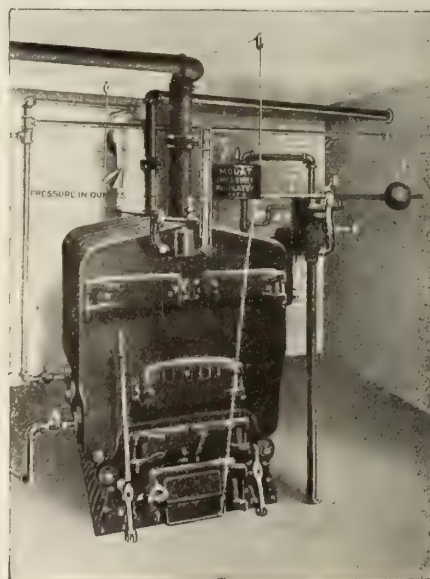
The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes. There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

THE MOUAT VAPOR HEATING SYSTEM

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

The Mouat-Squires Company, Cleveland, Ohio

**I'M
NYE
the
Die
Man**



This is a straight talk on the Nye Solid Die Stock, there isn't a joke on the page. If you really want to know why the Nye Solid Die Stock is superior to others, read this. It won't take but a minute, and some day you may want to know.

The Nye Solid Die Stock

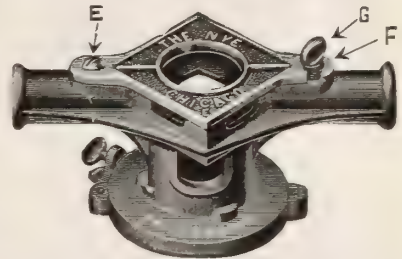
has automatic adjustable bushings, large openings for easy oiling, extra room for the discharge of chips, thereby preventing clogging; the handles are hollow through the body of the stock—this permits chips and oil to get away from the inside. The die plate cannot become separated from the body of the stock or swing loose in use. The automatic bushings are governed by a thumbscrew, easily operated with one hand—you never have to hunt up lost bushings.

My tools absolutely save money for every intelligent user. I sell all of them under the Nye Guarantee—a free trial and money back if they are not what I claim.

THE NYE TOOL & MACHINE WORKS

124 N. JEFFERSON ST.

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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

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Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a Want Ad. in this paper.

PEASE IDEAL STEAM BOILERS

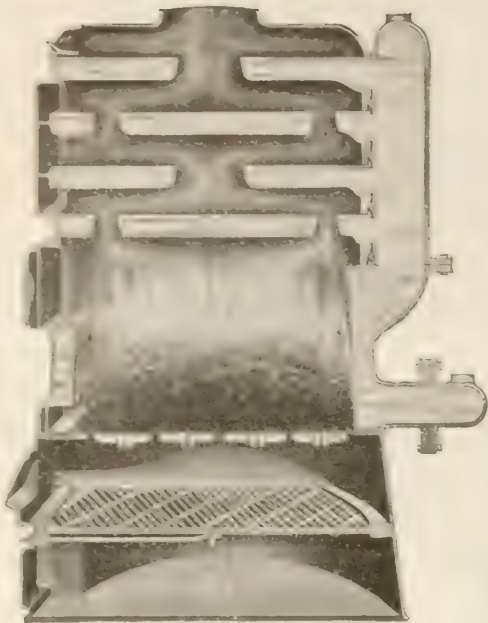
Write to-day for
Catalogue and Prices.

PEASE FOUNDRY CO.
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Works: Brampton. Head Office: Toronto.
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Cross Section, No. 5 "King," showing Corrugated Fire Pot, Tapered Smoke Passages, Big Mouths into Water Post, Scientific Arrangement of Heating Surfaces.



"King" One-Piece Ash Pit

Showing Tapered Smoke Passage, Tapered Smoke Passage, and Tapered Smoke Passage.

Did you get one of our "New Fitters' Hand Books?" If not, ask for one. In it we illustrate and list our complete line of "King" and "Imperial" Boilers and "King" and "Imperial" Radiators, also other valuable information.

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You don't have to draw on your imagination—

To sell a man a "KING" Boiler.

Simply point out its many advantages, and he will be convinced.

From Ashpit to Smoke Pipe its "improved," "up to the minute," and just a lap or two on every point ahead of any competitor.

Show your prospect the "Patented" Trouble-Proof Grates of the "King" Boiler, connected without split-pins or bolts.

Let him try the "side lever shaker" and demonstrate to himself how much easier and simpler it is to operate than the old-fashioned, back-breaking "crank."

Tell him about the "double in size" mouths on the water post and their importance in quickening circulation.

Explain to him the "Corrugated" Firepot, which increases its Heating Capacity one-third, also the large combustion spaces between sections, which allows the gases to burn before going to the smoke pipe.

These and the other manifold features of the "King" Boiler are ones that make an impression on a man. A half-hour's talk on straight common-sense advantages like these will influence your prospect more than all the "oldest firm" and "longest record" pleas the other fellow can think up in a week.

King Boilers are making records and reputations for themselves and those who install them.

"King" and "Imperial" Radiators are so well and favorably known that it is only necessary to mention them.

We guarantee prompt delivery.

We carry a full and complete line of Steamfitters' and Engineers' supplies.

Nova Scotia Association Make a Move

Secretary Godwin Sends Out a Splendid Letter Which Should be Read by All in the Trade, Whether Located in Nova Scotia or Not—Comments on the Necessity for Prompt Attention to Correspondence.

We herewith have great pleasure in reproducing a letter which Jno. E. Godwin sent out to every master sanitary engineer in Nova Scotia, and beg to make a few remarks regarding it. We were informed that while everyone engaged in the sanitary engineering craft received a copy only two or three responded to these letters.

This is typical of the sanitary engineer; he is a poor letter-writer; his correspondence is often absolutely ignored, and, as Secretary Godwin states in his letter—Those who are engaged in the craft are purely and simply mechanics. They lack the necessary education, and one of the chief features which should be attended to is the prompt response to all letters and correspondence. When one has written to a party and receives an answer by return mail, or within a reasonable period, the party receiving the response comes to the conclusion that his correspondent is a man of prompt action.

No one could be favourably impressed by anyone who neglects answering their letters, and no one frets and fumes so much as the sanitary engineer if he does not get a prompt reply to his inquiries. Often he is waiting to put in a tender and needs the prices of goods to send in this tender, but he forgets that, as a whole, the sanitary engineer is one of the worst men in business as regards his attention to such matters. If those who were present at the National Convention, held in Montreal this year, will recall some of the discussions, they will remember this topic of attention to correspondence was taken up, and many were the complaints made.

It is the attention to small matters that count in this, as well as all other, businesses, and is well proved by the old saying, "Take care of the cents," "The dollars will take care of themselves."

Look at the money which is being spent in looking into the details. It is by so doing that a thorough groundwork is formed for the larger mass of business, and there never was anyone could make a success in business who neglected the small details.

It would be very encouraging to hear of the sanitary engineers taking up this matter more vitally. The results would soon be realised in no small way.

F. DENIER, President
Toronto, N. S.

GEO. A. PERKINS, Vice President
Halifax, N. S.

Geo. KINSMAN, Treasurer
Halifax, N. S.

The Master Plumber's Association OF NOVA SCOTIA

JNO. E. GODWIN, Sect'y
90 Gottingen St.

Dear Sir:—

Just a few words about our association, of which we wish you to become a member. Volumes have been written and spoken about what the Local, Provincial and National Associations have accomplished for their members along the lines of trade protection, and many times our attention has been called to the greatest existing evil—the lack of business methods and principals in conducting our business.

How many Master Plumbers to-day know the amount of their expenses each year and consider that an item in making prices on work? How many of you know, when you have finished a contract, whether you have made or lost money on that work? How many of you know, when you figure \$100 for labor, whether it costs \$80 or \$125 to do the work? How many of you give that attention to your bills and collections that your jobber gives to your account?

The lack of this knowledge is the most dangerous enemy to our business. Our trade is advancing and the Master Plumber is becoming a merchant, though the process is slow—discouragingly slow. It is obvious that our trade is not as respected or as profitable as other lines, while the details are much more numerous and complicated than in any other business that I know of.

We seem to be afraid to let our customers suspect that we want a profit, even to the point of actually making them a present of what is rightfully ours. These conditions are present in our association and the cause is just this—that while there are exceptions, the Master Plumbers, as a rule, have had no business training. The plumber is essentially a mechanic, and he has been paying more attention to the mechanical end than to the financial end, and there is where the trouble occurs.

The remedy for this is a campaign for business education, and it is only through and by organized effort that educational movements can be carried out, and it is going to take the united effort of a combination of bright minds who will willingly sacrifice a portion of their time to remedy the evils in this trade. Therefore, organization is of value only when composed of men who will make a personal sacrifice in a generous effort to promote better trade conditions.

Are you going to be one of our number? If you have a grievance with any of the Supply or Jobbing houses and you are a member of the Association, it will be an easy matter to have same settled to your satisfaction.

Thanking you to sign the enclosed application for membership, I remain,

Yours Fraternally,

JNO. E. GODWIN, Sect'y.

LABOR DAY IN ST. JOHN'S.

The members of the local Plumbers' Union had a hand in assisting the Trades and Labor Council in the big labor demonstration held in St. John on Monday, Sept. 1. The plumbers had a float for the parade which made an attractive showing. It represented an up-to-date kitchen fully equipped, with a bath-room adjoining displaying all modern plumbing appointments.

DR. J. S. W. McCULLOUGH RETURNS FROM EUROPE.

Says Canadian Engineers Can Handle Problems, But Public are Slow to Realize Urgency of Improved Sanitation.

"Although equal in engineering efficiency and capacity, Ontario has still

something to learn in sanitary engineering," is the opinion expressed by Dr. J. W. S. McCullough, Secretary of the Provincial Board of Health, on his return from a nine-weeks' tour through the British Isles and Europe yesterday.

"We have not got much in the way of sewage disposal," he said to the Globe, "and the European cities are a long way in the lead."

Dr. McCullough, in company with Dr. C. A. Hodgetts, Medical Advisor to the Conservation Commission, went to Europe under a special commission from the Ontario Government to study the question of sewage disposal and public sanitation. Mr. A. E. Semple went along as secretary. The party visited London, Liverpool, Glasgow, Manchester, Birmingham, East Hampton, Dublin, Belfast, Leeds, Huddersfield, toured through the principal parts of France and Germany, and made other observations wherever information was to be secured.



A panoramic view of Canadian National Exhibition at Toronto, taking in the Manufacturers' Building, Press Building, the Grand Stand, the Dairy and Applied Arts Buildings, and the big fountain. Lake Ontario is just beyond the Manufacturers' Building.

Sanitary Goods at the National Exhibition

Those who were interested in sanitary and heating engineering were certainly well catered for in this year's Exhibition. Some of the finest and most up-to-date fixtures were displayed. The manufacturers and jobbers spared no time or money in their endeavor to portray in a practical manner their products. The public must have been pleased and surprised to see the great strides which have been taken in the progress of sanitary appliances.

The exhibits along these lines were far in excess of any other trade or calling, when we consider the heating appliances, such as ranges, gas stoves, gas plates, gas water heaters of every kind and style, both instantaneous and other-

The James Robertson Co., Ltd., Toronto, had a beautiful display of goods in this line. Their exhibit was a treat, and the brass goods, all of which were their own make, were of a high class. Some they exhibited were, we are told, unconditionally guaranteed for 5 years, particularly their valves basin and bibb cocks.

The James Morrison Brass Mfg. Co., Ltd., had a very interesting and instructive display of all kinds of engineering specialties. They were of a very high order, and those who were interested in

this line could not help but admire the splendid lay-out. Every kind of brass valves, fitting and other accessories were displayed at this stand.

The Monarch Brass Mfg. Co., of Toronto, played no small part in this Exhibition. Their display of brass goods was very novel. The assortment of valves and bath room accessories were very interesting. They also had a very fine showing of "Beaver Brand" enamelware. When one looks back to the time when the old closed in baths, copper-lined, and some painted sheet zinc, were the order of the day, one cannot help coming to the conclusion that manufacturers must and have played a very important part in the evolution of sanitation.

Standard Ideal Co., of Port Hope, had as nice a display as one could wish to look upon, and many were the improvements that could be seen since the last year's exhibit. This company as well as all others are striving with might and main to put on the market the very best goods. This year we are told the demand has been for higher priced goods, thus giving the manufacturers a better margin on their products. It is a well-known fact that low-priced goods cost more as far as actual labor put into them than a higher class, for the simple

reason that the material is there in the good goods whereas everything is poor in a low-priced article.

Tallman Brass and Metal Co., of Hamilton, had a splendid display of their products. Electric fixtures was one of the main features, although one received quite an educational treat by being shown the different stages which some of their products had to pass through. Ingot metals, bearing metal, all kinds of bar and sheet metals were on view and some very remarkable aluminum casting was seen at this stand. There was also some very fine specimens of metal spinning on exhibit by this company.

Canadian Borden Company of Toronto made quite an interesting showing at their exhibit. They had some of the finest pipe-cutting and threading tools one could wish for. Anyone who wished to get rid of pipe-cutting troubles should write them for particulars regarding their line. To watch the operator cut a piece of pipe with such ease, such accuracy and no burr was quite a treat. They claim to have the last word in pipe-cutters.

The Canada Metal Company, Toronto, were there with their weighty products. Mr. Harris was in attendance and in-

formed us that they had only ten tons of assortments. Every description of ingot metals, such as type-metal babbitt. The well-known Harris-metal, lead pipe from $\frac{1}{8}$ to 4 inches was to be seen here. All kinds of solder such as tinner's wip-ing, half and half, and wire solder.

In bath room fixtures the public were given a treat by the display shown by the **Standard Sanitary Manufacturing Co., Ltd., Toronto**. Everything in baths, lavatories, and w.e.'s were on view, the latter being equipped with the very latest styles of valves and up-to-date tanks. They distributed a very interesting little book, entitled "The Evolution of the Bath Room From 1875 to 1912," which certainly shows a great contrast. Mr. Lyons was in charge, and could explain the manufacturing process of their goods from A to Z.

Messrs. Macdonald & Sons, Ltd., of Church St., Toronto, were on hand with a splendid display of steamfitters' tools and appliances. Their Toledo and Jardine pipe threading machines being the main feature of this exhibit. When one looks back at the old antiquated tools one had of necessity to use, of the muscle-straining one had to do to thread even a one-inch pipe, it does one good to see the great strides some manufacturers of tools for this purpose have made within the last few years.

The Gurney Foundry Co., Ltd., played no small part in this year's exhibition. Their display of gas stoves was a treat. The choice one can get now in comparison to a few years ago, prove that such firms as the Gurney Foundry Co. have spared no money in improvements along these lines.

The Canadian Rector Gas Heater Company exhibited a full equipment of heating installation, which was very interesting and instructive. It showed a novel method of radiation by the sole use of gas. This must have been appreciated by those who reside where gas is cheap. They not only claim their equipments to heat, but also to ventilate homes as well.

The Rudd Manufacturing Co. were again to the fore with their instantaneous water heaters. This company introduced their heaters to the Canadian people some years ago, and have made such rapid progress that they now have one of the largest factories in Canada which make heaters alone.

The Mueller Manufacturing Co. of Sarnia, Ont., had a very interesting display of brass goods on hand, a class which the public are demanding more of every day. This company do not pretend to cater for the cheap, low-priced goods which at times flood the market. They stand back of their goods, and

have their name stamped on every piece they turn out. Their new factory in Sarnia is busy as can be, so we are told.

The Pittsburg Water Heater Co. were on hand with several styles and sizes of their instantaneous heater, which were fitted up in actual working order. One cannot help being surprised at the improvements made in water heaters of this class. The action of the water being turned on instantly gives hot water, and the moment it is closed off the gas is also turned off automatically. These heaters are filling a long-felt want in no small way.

The McClary Manufacturing Co. of London had a beautiful show of ranges, stoves and water heaters. This company certainly know how to cater for the public, and those visiting the Exhibition this year must have been pleased with this display. The Climax water heater played no small part, and the demand for heaters of this kind is becoming more numerous every day, and especially where a cheap supply of natural gas can be bought.

The National Equipment Co., Ltd., of Toronto, were exhibiting their pumps for use in country residence equipments. Those who have their summer cottages or even permanent residences can now enjoy the same domestic comforts as the city residents. These water systems are so compact and mechanically perfect automatic in action that the average individual can easily give them the small attention that is necessary.



SASKATCHEWAN WATER SUPPLY.

Pure Water in Saskatchewan—Pollution of the Streams Prevented by the Treatment of Sewage.

The Bureau of Public Health of the Province of Saskatchewan is striving to reduce the typhoid death rate in that province by preventing the pollution of streams. The Bureau impresses upon the municipalities of the province the

necessity of establishing sewage treating systems which will render the effluent innocuous and incapable of supporting disease germs. The bureau also points out the lessons to be learned from the unfortunate experience of older municipalities elsewhere on the continent.

The engineering officials of the bureau systematically supervise and inspect the existing sewage disposal works and offer suggestions with a view to increasing their efficiency. By the close of the present year the sewage from all the cities and from thirteen towns in the province representing one-third of the population, will be rendered practically harmless before being discharged into the waterways. In 1912 there were only five sewage disposal plants in operation, capable of treating sewage from a population of 16,500 people, and the remarkable increase bears witness to the willingness of the municipalities to co-operate with the Bureau of Health in the improvement of the condition of the provincial waterways.

Surface water supplies are, however, subject to pollution, not only from the section of the population that lives in isolated houses, camps and villages along the banks of the streams; a portion of the population which all too frequently uses the waterways as common sewers. Pollution from such sources is often responsible for outbreaks of typhoid in the province, and the bureau now intends to turn its attention to this matter.

The typhoid death rate in Canada is 35.5 per 100,000 of the population. In Norway, Sweden, Holland, Germany, Switzerland and Great Britain, the death rates vary from 6.2 to 12.8 per 100,000. Up to the present, Canada has been notably backward along the lines of water purification and the prevention of pollution, but these questions are now being forced into prominence, and it appears that the work so efficiently conducted in Saskatchewan will be duplicated in the country at large in the near future.

A Few Don'ts.

- "DON'T" let the speculative builder ruin your reputation.
- "DON'T" use vertical check valves where you can use a swing.
- "DON'T" know it all, your men know a little if they don't fire-em.
- "DON'T" cut your own figures down to please your best customer; if you do you won't have him long. Figures seldom lie.
- "DON'T" be too much of a BOSS with your men, a little judicious personal intercourse is cheaper and works better than good oil on dies.



1. Boddington and family; 2. Fullerton and half his family; 3. Read and family; 4. Mrs. and Mr. Farthing.

No. 1.—Walter Boddington and Family.—Mr. Boddington conducts a very creditable business at Wilton Crescent, Toronto. He is a hustler of no mean order and is a hard worker in the interest of the Toronto Society of Sanitary and Heating Engineers. He is always ready and on hand when there is work to be done which will be of any benefit to his fellow tradesmen. Mr. Boddington is also one of the members of the executive of the society and has been in business for 12 or 15 years in Toronto.

No. 2.—Mr. Read and Family.—Mr. Read is one of the company of Messrs. Read & Frankland, Ltd., of Bloor St., Toronto, and of course is a member of the Toronto Society. A good worker in the cause and ever on hand to help out. Mr. Read has been interested in the trade for over 8 years and knows the

business from A to Z. This photo was taken at a time when they were all on pleasure bent at Hanlan's Point.

No. 3.—J. E. Fullerton and part of his Family.—Mr. Fullerton has two sons and two daughters and we have not had the pleasure of securing them altogether as yet, but hope some day our Snap-Shot-Artist will be one too many for them and secure them all. Mr. and Mrs. Fullerton are both hard workers for the good of the Toronto as well as the Ontario Societies. He is a Mechanic himself and is a very alert and hard worker. Always on the job whether on business or pleasure. He is a man whom one feels better for having been in his company. If on pleasure "why it's pleasure." Never talk shop then, but if business, then it is business in real earnest. We only wish more were like

our worthy fellow craftsman, J. E. Fullerton, of Toronto.

No. 4.—Mr. and Mrs. Farthing, of East Toronto.—Brother Farthing is another fellow-craftsman we have pleasure in introducing to those of our readers. We are doing this so as to bring one another into closer relationship. Mr. Farthing has been in the trade quite a number of years, is a member of the Toronto Society and a worker. Some of the brightest of our citizens in the sanitary and heating business are live members of this society which is doing a great deal of good by way of educational and other lines. They feel the responsibility which is theirs by rights and by the fact that sanitation and sanitary engineers are those who hold the health of the people in their hands.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - *President*

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Edwin Newsome, - - - *Editor*

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, SEPTEMBER 15, 1913

SANITARY ENGINEERS NEED EDUCATIONAL STUDY.

In other columns of this issue we quote the necessity of sanitary engineers paying more attention to their correspondence. The evils which arise through the neglect to correspondence is alarming and not only so but is really very hurtful to a man's reputation.

Often the character of the man is doubted who neglects to respond when written to. For instance, suppose a sanitary engineer has just completed a contract, turned it over, to the owner, got his cheque and apparently finished his end of the business, when some little thing goes wrong and of course the owner writes pointing out the trouble, etc.

The sanitary engineer says to himself, "Oh, yes," it's just so, etc. I wonder why Mr. Jones don't just tighten this or that up a little, it's so simple, and will save me going all that distance out," etc. when all at once the phone bell rings.

The letter is forgotten and in the evening you have a thousand and one other things which have accumulated. The letter is still left unnoticed and so on.

Mr. Jones works it out in his mind that his letter will reach you such a time and he should get a reply by "such a time." Then at the expiration of that time he begins to fret and fume at not getting an answer, he wires you and you are out till the evening. You get the telegram and wonder again why Jones can't do so and so. You find it is too late to send a telegram, you think you will write. But pull out your pocket-book and begin figuring on something you were looking at before you entered your office.

You finally write, but on account of the lateness of the hour the mail will not leave your town till next morning. Possibly not reaching Jones till the following morning. However, in the meantime you get a long distance telephone message from Jones and you find the case is one for urgent attention and take a man out with you, etc.

Look what your neglect has done. It has created in the mind of your customer the idea that you were indifferent to him. He will never forget the fretting, fuming and anxiety he has undergone because of the delay. Again, the chances are if you had answered his letter at once explaining what he could do to overcome the trouble and stating the inconvenience the journey at that time would

put you to your customer would have been able to help you out, and the trouble remedied at once.

If all other tradesmen were to treat their correspondence as our present sanitary engineers do the progress of this world would be nil. One cannot say too much or even enlarge unduly the absolute necessity for promptness in answering one's letters.

If for instance one could impress upon the members of our craft its vital importance, its position as regards responsibility to the human race, they would study a little more both mechanically and along the lines of business management and the trade and those engaged in it would soon be looked upon as men of note. The universities are now wakening to the fact that sanitary science needs to be a separate study of its own. They are setting aside special professorships and studies for the educating of men who are about to enter the field of sanitary engineers, and be such in more than name. Sanitary engineers who will study the construction and mechanical, as well as the scientific engineering field which belongs to those who will follow the men of the present day. They will also receive a business training which has been denied as it has to those who are now engaged in the craft. They will be business as well as professional men. They will be trained to attend to the little things. They will attend to their overhead charges, and know exactly what those charges should be, and how they are arrived at. How many know to-day what their overhead charges should be? Very few. Our successors, will not neglect their correspondence. How many who claim to give their letters proper attention leave this portion of their business till the end of the day. This should not be. If one could call into some of the large offices belonging to large concerns they would find that correspondence is the first part of the routine; all other matters come after. To miss a single mail delivery may be disastrous to lots of business matters. Another thing let us mention in conclusion.

Never write a discourteous letter under any circumstance. It may not look or read too bad when you write it, but has every possibility of seeming to have quite a different tone to the receiver of the letter. One can often say a thing to another which cannot be written and understood in the same way. So let us urge one another to answer all our correspondence promptly and courteously, remembering that the other fellow is waiting for an answer, and we are responsible for the waiting.

Analysis of Canadian Sanitary By-laws

Commenting on the Toronto By-law No. 6388, Which Was Passed on March 18th of This Year. This Being a New By-law, Several New Features Are Embodied Which Will be Very Interesting to Our Readers.

This by-law has several good features embodied in its make-up. Some of its clauses are very general and have been included in almost all other city by-laws, such as the weights of lead pipe, soil and waste pipe, lead bends and the like also the length of brass ferrules. We will pass over a few such clauses to refer to clause 8, which reads as follows:

Between the building and the public sewer or drain there shall be placed a ventilation hand-hole cleaning trap of approved description and make.

This trap which while not placed within the area of the house is really what may be termed "The main house trap."

This trap has been discontinued for many years in most of the large cities all over the world, and while it seems to be a debatable point with some sanitary engineers, others of equal authority are emphatic in their opinion that these traps are a very objectionable obstruction. There is not the slightest doubt but that they do impede the passage of sewage to no small degree, and when placed in the area of the house are very objectionable, particularly if the cap which is supposed to be fitted over the hand-hole happens to be loosened.

Clause 9 is the next to consider between the said trap and the foot of the soil pipe there shall be connected with the main house drain an inlet pipe, for the admission of fresh air, 4 inches in diameter, to be situated at least 10 feet, if possible, from any opening into the house, and not less than 12 inches above finished grade, the mouth of which shall have a return bend or a cap giving an area of one-fourth more than the diameter of the inlet pipe: said air inlet to have at least four feet of cast iron pipe attached to it, and be supplied and placed in position by person putting in drain, to which it is attached.

This clause is also a very debatable one. It is one which should be abandoned as belonging to the past. It claims to be for a certain purpose which it never fulfilled. The inlet pipe mentioned "for the admission" of fresh air. Will also "emit foul air."

Each time a fixture is flushed the air in the house drain is reversed in action fresh air may at different periods be drawn in through the house drain. But

how many actually do in practice. The writer has taken several tests when the temperature varied to see if there was a section of air and not a single instance was there found to be any air being drawn in, but in nine cases out of ten when a light was placed at the mouth of the inlet pipe and the w. c. flushed the air was driven out.

This is to say the least dangerous. Further one would be making a very moderate statement by saying that right here in Toronto ten per cent. of these air pipes are blocked up or the cap broken. Then again, what is the reason for the air pipe having to be placed ten feet from any opening, if it is for the "admission" of air. Those who formed this clause must have had some doubts of "admission" or felt that there may be a possibility of it "emitting" foul air out," else why ten feet. Further in clause 8, a hand hole trap is called for which of necessity has to be placed several feet underground. Why not have the hand-hole extended to the surface and capped instead of being capped away several feet down.

Clause 10 is a very commendable one and deals with conditions where there is no sewer located and reads as follows:

In case of a building or buildings to be built on a street which is not sewered, septic tanks may be installed upon receiving a special permit from the medical health officer, and they shall be subject to conditions imposed by him from time to time.

Clause 11 refers to the quality of tile pipe to be used. Whereas in almost every city of note tile pipe is not allowed at least inside the area of the houses and is often carried as far as ten feet through the outside wall. No one who has the true cause of modern sanitation would tolerate for one moment the use of tile pipe. A certain English publication printed an article on the dangers of using tile pipes and pointed out that just recently investigations had taken place in different cities, and that on account of the heavy traffic along the thoroughfares it was found quite a large number of feet of both house drains and main drains were broken with vibration from said heavy traffic and that in such cases extra heavy cast iron pipe would have to be laid. This is the result of thorough investi-

gations by men who feel their responsibility to the general public.

Clause 12 is general and forbids the use of 90 degree fittings or bends which is very good practice.

Clause 13 refers again to vitrified salt glazed pipes, etc., and weeping drains which must not be connected otherwise than on the house side of the trap.

Clause 14 also refers to the connecting of weeping and subsoil drainage.

Clause 15 deals with the way the tile drains shall be laid if in new ground and reads as follows:

All earthenware drains laid on newly made ground or very wet soil shall be laid on a prepared foundation of 2-inch pine plank or 4 inches of concrete. No built trap or mason's trap shall be used inside of any building. All traps on earthenware drains shall be of vitrified salt glazed earthenware, and all traps to have hand-holes, and said hand-holes extended to the surface.

No inverted joints of any kind will be allowed below any fixture.

Clause 16 deals with place where the house drain shall connect with the main drain, etc., and is embodied in almost every by-law.

Clause 17 refers to the trapping of rain water leaders when same are connected with system of house drains and is very necessary.

Clause 18 reads as follows:

All drains used for sewage or waste water under any building shall be of cast iron, or vitrified glazed earthenware drain pipe and of the kind and weight specified by this by-law.

Clauses 19 to 25 are general and necessary in all by-laws governing sanitation in our homes.

Clause 26 is one which is very objectionable we are told. It forces the sanitary engineer to connect his work to the tile drain and also makes him responsible. This is felt to be a hardship because oftener than not the sanitary engineer has trouble with the tile drains not being tight, not because they were not tight in the first place but rather on account of the hard usage the tile pipe is put to before the ground has settled. The sanitary engineer has great difficulty in getting an efficient test put on. Now if cast iron soil pipe was made this soil pipe could be started at the outside of house line and being cast iron

could be completed and tested along with the stack, thus making the whole "roughing in" more thorough and one test would be ample.

Clauses 27 to 33 are general and deal with the sizes and weights of pipes allowed.

Clause 34 is good, and is as follows:

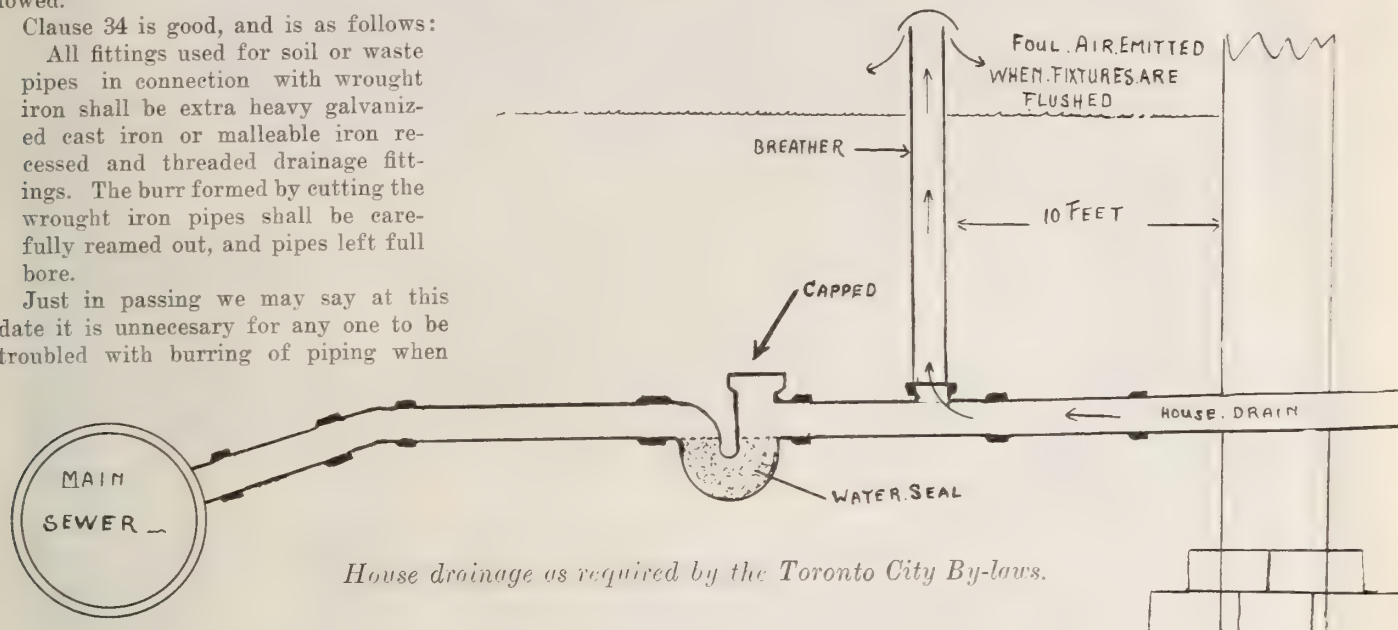
All fittings used for soil or waste pipes in connection with wrought iron shall be extra heavy galvanized cast iron or malleable iron recessed and threaded drainage fittings. The burr formed by cutting the wrought iron pipes shall be carefully reamed out, and pipes left full bore.

Just in passing we may say at this date it is unnecessary for any one to be troubled with burring of piping when

Pedestal urinal	2
Urinals	1½
Laundry tubs, 1 to 3 considered 1 fixture	1½
Kitchen sink	1½
Pantry	1½

of 113 gallons per day for every person in the cities where they have water-works.

We venture to state that at least 40 per cent. of this can be accounted for by leaks.



House drainage as required by the Toronto City By-laws.

cutting, as there are several firms making cutters now which cut without burring. Any of which firms we will be pleased to refer to on enquiries being sent to this office.

Clauses 36 and 37 are general and popular.

Clause 38 is first-class and one which should be embodied in every by-law. Viz:—

Waste pipes from basins and baths or other fixtures will not be allowed to connect to water closet bends, but must have a separate fitting to receive the same.

Such a clause practically eliminates the necessity of backventing and especially if a good deep seal trap is used. The chief factor which cause syphonage was where more than one fixture was branched into the lead bend or where several waste pipes were connected together, thus allowing the flow of waste water to form a suction on the other piping and trap of its neighboring fixture. But where each fixture has an outlet to the main stack which as a rule are not less than four inches syphonage is almost impossible as it is really equipped with the stack which acts as a vent and is four inches.

Clause 39.—No waste pipe from any plumbing fixture shall be less than inside diameter of its trap.

Clause 40.—The size of traps for a given fixture shall never be less than the following inside diameter:

	Inches.
Water closets	3
Slop sink	2

Wash basin	1¼
Bath tubs	1½
Shower bath	2
Sitz bath	1½
Drinking fountain	1¼
Dental cuspidor	1¼

Clause 40, which speaks for itself has at least one feature to be commended and that is all baths shall have 1½ traps.

We know of quite a few cities who allow 1¼ wastes. This is too small and particularly if the run from this fixture happens to be a good number of feet away from the stack.

We shall take up the rest of this by-law in our next issue as there are several very novel points to take up. We have herewith produced several cuts as to how branches, etc., should be made with cast iron pipe and also a sketch showing what the city of Toronto requires regarding the air vent. These are not only poor sanitary engineering but are also a nuisance and eyesore on every lawn in the city.

The total cost of maintenance per annum is about \$3,435,000, and to be very conservative \$1,000,000 of that could be saved by "fixing the leaks."

Here's an old friend in Bill Rose seen strolling toward the Ball Park on a Saturday afternoon with Mr. Ben Noble, which park is (according to Tommie Rich) the coolest place in London—on account of so many fans.



HOW MUCH OF THIS IS DEMANDED TO SUPPLY THE "LEAKS?"

Montreal heads the list for consumption of water. She needs 70,000,000 gallons per day.

Toronto comes next and takes about 45,000,000 gallons per day.

Other Canadian cities take about the same per capita, which is on an average

Mr. Rose, an old Petrolia boy, now lives in London. Some say he moved to London on account of the difficulty of explaining to his many friends the railroad connections with Petrolia as the lines were omitted from some of the maps. Ask Bill to explain this, the new Union Station at Tillsonburg and the Economizer.

New Sanitary and Heating Goods

The Imperial Foundry Co., Ltd., of Milton are now placing on the market a very novel steam and hot-water boiler. It is very unique in design. They claim



their boiler to have the largest amount of heating surface of any boiler on the market.

Those who wish to know more about the Milton boiler should write for their very interesting and illustrated booklet, *How to Use an Application*.

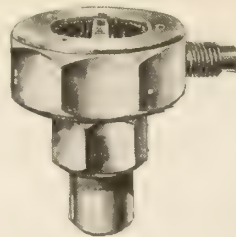


drawn brass, joined in the centre by a solderless, water-tight joint. The inlet is a continuous tube inserted to a point considerably below the centre line, the outlet projection extending only to the point where it joins the body.

When conditions are such that syphonic action takes place, all the water is drawn out of the inlet tube without materially disturbing the water level in the body; as soon as the water in the inlet tube reaches the bottom of the tube, a sufficient amount of air is admitted to break the syphon, whereupon the water in the outlet tube and that in the body finds a level, submerging inlet tube and forming a seal, which cannot be broken.

The above features will make the Femco trap exceedingly popular.

Very attractive prices are being quoted by the Canadian Brass Co. to the trade.



Air Line System Applied to Steam Heating.—The system of steam heating is coming to the fore in very great strides, and bids fair to become the most economic of any other method. This is the results of study and brain-racking research work.

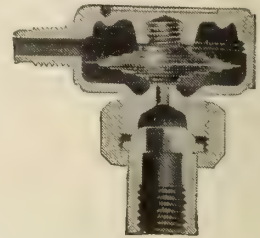
Messrs. C. A. Dunham & Co., Ltd., of Toronto, claim to have perfected what is known as the Dunham air line valve, which is illustrated in Figs. 1 and 2.

The air line system, properly equipped and installed, is intended to rid the system freely and quickly of all air; eliminates the discharge of air into the room, does away with sputtering air valves, and affords as easy circulation of steam as it is possible to get in the ordinary system.

To do this successfully and continually, the air line system must be equipped with an air valve on the radiator that has a large clear opening for air to escape. It must be of such construction that even with a large opening, when cold, it must close off tight when steam reaches the valve. It should be free of screens, and of such design that foreign matter will not clog it up. It should be such a valve as will operate

on a wide range in steam pressure without altering any adjustment. In other words, it should be fool-proof.

Such a valve saves money for the heating contractor, for the owner is quicker to accept a satisfactory installation. It saves time and money for the owner,



for repairs are eliminated, and no time is required in venting the system.

The Dunham air line valve is represented by the manufacturers to be such a valve.

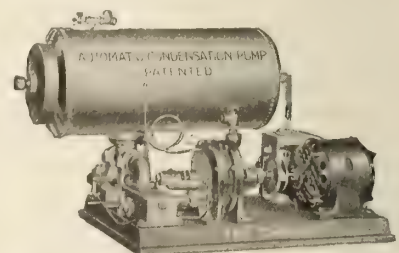
The corrugated disc is filled with a fluid which vaporises at steam temperature. It is immaterial what steam pressure is used (within the range of the ordinary low pressure gravity system, from 0 to 10 lb.) the disc will expand when steam surrounds it and closes off the valve.

The body of the valve is constructed of cast brass, ensuring strength and long life. The disc is constructed of tempered bronze, and is adjusted and tested when assembled so that no later adjustments are necessary.

The C. A. Dunham Co., Ltd., Toronto, have an interesting bulletin on the Dunham air line valve ready for distribution to interested parties.

IMPROVEMENT IN PUMPS

The Chicago Pump Co., of Chicago, have embodied several improvements in their latest model of condensation pump. They are the patentees and sole manu-



facturers of what is known as the tilting tank receiver, which avoids the use of troublesome floats within the tanks.

The chief new features in this improved pump are as follows:—

(Continued on page 21.)

The Canadian Brass Co., of Galt, are now placing before the trade the Femco trap, which is a water-tight joint. The inlet is a continuous tube inserted to a point considerably below the centre line, the outlet projection extending only to the point where it joins the body.



One of the many beautiful displays at this year's National Exhibition.

Exhibit of The James Robertson Co., Limited

The exhibit of **The James Robertson Co., Ltd.**, was one of very high order, the goods they displayed were of the finest. The splendid quality of brass goods all of which were their own manufacture was all to be desired. One line of brass goods seen there was unconditionally guaranteed for five years. **The James Robertson Co., Ltd.**, have men of long experience on their staff, who know the weak points of any line in the sanitary or heating fittings. These men are always studying what is necessary to keep their line of goods to the front, both in quality and finish.

Where would the trade have been to-day had not such firms as this we are now considering been progressive, live up-to-date men. By their aid and theirs only has it been made possible to revolutionize sanitary engineering.

Through their effort we are able to enjoy what at a very recent date was termed a luxury. **The James Robertson Co., Ltd.**, stands for quality and no manufacturer need try and put a poor article on the market through this company.

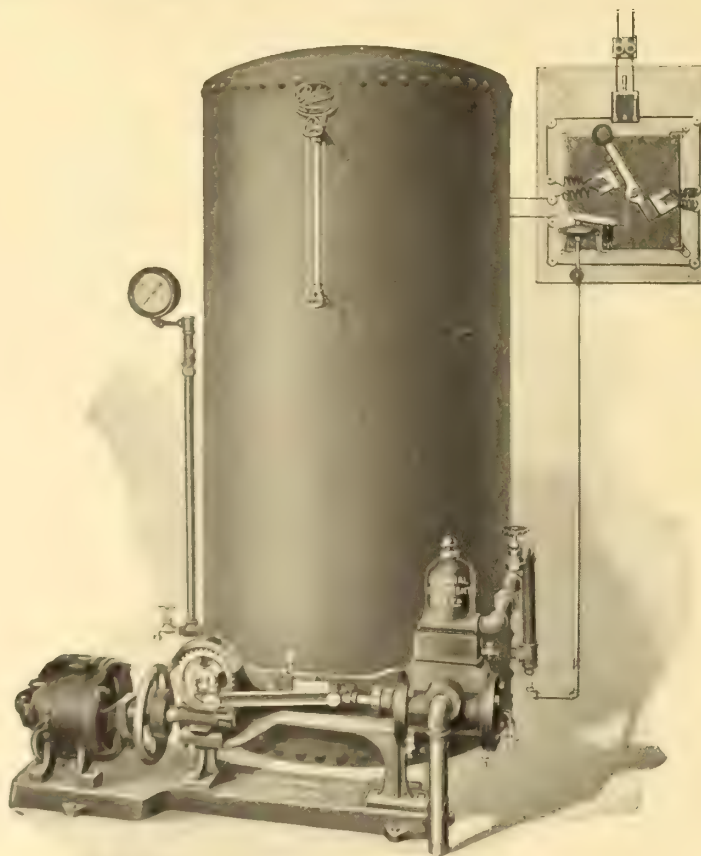
It is surprising how easily one can associate the name of **this long established company** with plumbing goods; even on the street when speaking of this line the name comes to one quite naturally: Enamelled iron baths and lavatories, water closets with side flushing valve, also with bent wood and china tanks, flushometers, Bellemeade lavatories, kitchen sinks and laundry tubs, showers, Peerless boilers.

Another very good line was the Lillie patent soldering nipple. This nipple has some very fine features in it. By the use of it at least half time of wiping a joint can be saved as well as half the solder necessary. Then beside those two features the joint is a better one. In wiping it, one saves time because he needs no clamps to hold the nipple, he just simply screws the lead pipe into the nipple which has an interior sharp thread deep and long enough to cut a thread on the lead pipe. These nipples are to be had for any sizes of both waste and water pipe. It is only one of the many novel articles sold by This Progressive Company. We hope they will be at the old stand next year when we know there will be more surprises in store for the visitor or buyer.

PEERLESS

W SYS

**Made in Canada
By Canadian Labor
with
Canadian Money
for
Canadian People**



Peerless (400 Series)

**Direct Connected, Worm Driven
Silent Electric House Pump**

Capacity 500 gallons per hour at 50 pounds pressure, with peerless special combination air intake and automatic motor controlling switch.



Showing

**With a Specially
In**

eliminating the old style leakage due to its use.

Get special new price either vertical or horizo

National Equipment Company

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

LESS

R
MS

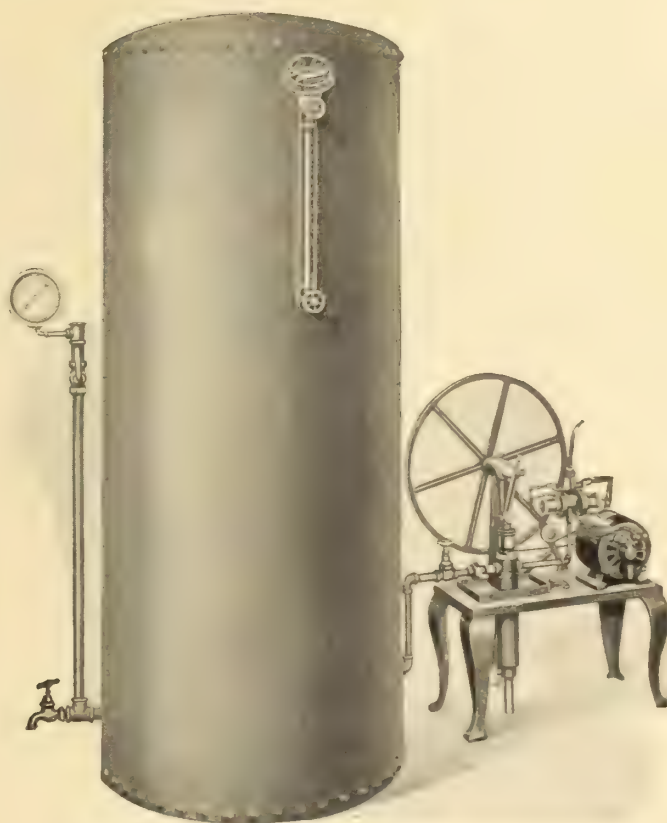
**Our Guarantee is Not the
Long Distant Kind—We're
at Your Very Door - -**

**Doesn't This Mean
Something to You?**



Figure 112B
Pump and Air

and the troubles from
with 3 sizes of tank



Peerless (300 Series)

**Pump Capacity 125 Gallons Per Hour
Against 40 Pounds Pressure**

Absolutely silent and automatic in operation. A one-eighth horse power motor connected to lamp socket does the work.

Limited, Toronto, Canada

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."



Exhibit of James Morrison Brass Mfg. Co., Ltd.

Messrs. James Morrison Brass Mfg. Co., Ltd., had a splendid display at the Exhibition this year, and was of excellent variety which made it both instructive and interesting.

There is not the slightest doubt but that **this company** are masters of the industry which produces **Brass Goods**. Every line was on exhibit at this stand, both for Sanitary and Heating, Locomotive, Stationary and Hydraulic, Marine and Electrical Engineering, the Sanitary and Heating Fixtures, etc., composed of cast iron enamelware, porcelainware, nickel plated brass goods, such as bathroom accessories, bath cocks, etc. A fine sample of water heater was shown, and a very novel instantaneous Steam Water Heater for the supplying of public institutions.

Locomotive engineers must have been interested with the different varieties of Safety Valves, Injectors, Steam Gauges and other mountings. There was also a splendid variety of Steam Sirens and Whistles, Gauges and other appliances used for Signalling, both for Marine, Stationary and Locomotive Engineering. In fact, the **Firm of James Morrison Brass Manufacturing Co., Ltd.**, are one of the pioneers in the manufacture of these lines. Their goods are approved of and used by all the leading **Provincial Governments of Canada**. Any who are an authority on this class of goods which were on view must have been very well pleased with this exhibit. At such affairs as an exhibition firms are very much tempted to display their very best quality of goods. But **The James Morrison** People simply took the goods they had on exhibit from their everyday stock.

They are also experts on water works supplies and employ expert mechanics, whose duty it is to study the weak points of each fitting or accessory, as the case may be. By such a method every weak part is strengthened, and not only that, but improvements made generally.

It is by having such companies as **The James Morrison Brass Manufacturing Co., Ltd.**, that such a revolution in the **Brass World** has taken place. No amount of money or brains is spared in this feature of **the company**. It is only by looking back at the crude methods of fitting up and mountings used that one can realize the necessity of patronizing **such firms**. This company also cater to the Electric Fixture line in a very marked degree. The only trouble one would experience would be that of being spoilt with the volume of choice to be had.

They are designers of this class of goods as well, and nothing is manufactured in this line but what is their own exclusive design. When one happens to see a fine installation of Brass Railing in the different banks or public institutions they at once are reminded of the name of James Morrison Co. Mr. Betton was in charge and was very entertaining. He seemed to have the business of Brass Goods down to a tee. No question seemed to be too hard for him to answer. Mr. Betton has been in the employ of this company for years, and is well known by the trade in general. There is not the slightest doubt but that the exhibit of the James Morrison Company will leave a lasting impression on those who are interested in this line, and one which, we hope, will be renewed by a visit to the 1914 Exhibition.

NEW SANITARY AND HEATING GOODS.

(Continued from page 16.)

1—A base which contains two settling chambers with plugged openings for cleaning.

2—Set of trunnions.

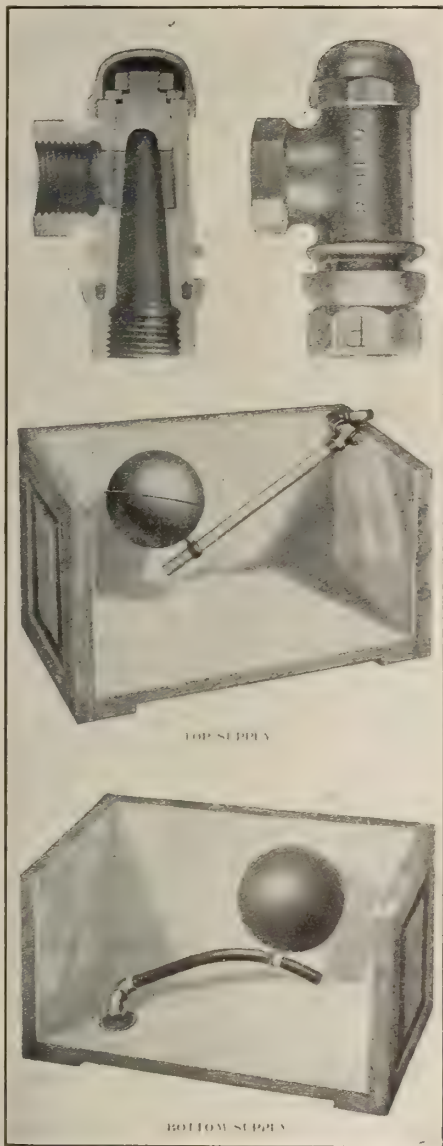
3—Galvanised iron tilting receiver.

4—Turbine pump and motor.

5—Double carbon contact automatic switch and fused hand knife switch.

6—New automatic boiler feed.

They claim this outfit is the last word in condensation pumps, and those wishing for further information may acquire same by applying to the Chicago Pump Co., of Chicago, Ill.



Messrs. Rotico Fitting & Supply Co., of New York, have recently put on the market a new and novel float valve. They claim it to be the most simple in construction, durable, and most practical in every way. It is made of the very finest material, and fully guaranteed.

We have pleasure in reproducing half tones of this float valve which, to the trained mechanic, speak for themselves.

On another page will be found the claims as registered at the Canadian Patent Office.

They also claim it will not stick or corrode, and that the pressure is not against the valve but is received through the valve. It will also be seen that the aim of the ball or float is a combination of arm and supply pipe, and is much more rigid. Further particulars can be furnished by writing to the Rotico Fittings & Supply Co., 25 West 42nd Street, New York, N.Y.

London, Ontario gets most of its water from artesian wells which must certainly be in good order and reflects great credit upon the engineering department. From Jan. of this year, 1913, to July 23rd, no case of typhoid was reported. It is to be hoped such reports will continue especially when we know that typhoid is a most filthy preventable disease actually brought on by rank carelessness on the part of those who are at the head of our engineering and water works departments, and Ontario has suffered losses which cannot be estimated by the wholesale polluting of her drinking water.

WEIGHT OF HOT AND COLD WATER.

Editor, Sanitary Engineer.—Is there any difference in the weight of cold and hot water? Please give some figures.—Helper.

Water at boiling point (212 degs. Fahr.) is stated to weigh something like 59 lbs. a cubic foot.

Water at the temperature of 32 deg. Fahr. weighs some 62 lbs. per cubic foot.—Editor.

CAST-IRON PIPING.

A Scottish manufacturing firm, who are patentees of lock-joint cast-iron piping for water and gas works, invites inquiries from Canadian engineers responsible for drafting projects for municipal and railway work.

HOW TO GET QUICK CIRCULATION.

Editor, Sanitary Engineer.—If a plumbing job is laid out on the circulating plan on what does the speed of the hot water depend, and how can it be best accomplished?—Hotel Man.

It would depend upon the amount of fire, the height of the current, the amount of friction in the pipes.

To speed up the water the pipes should be thoroughly reamed, as few turns made as possible, and long sweep fittings used. The correct size of pipe should be used for the number of fixtures to be used.

In this way a remarkably quick service can be obtained.—Editor.



Mr. Sid. Adlard, of the Cochrane Hardware and Plumbing Co., Sault Ste. Marie, is certainly some sport. The hot days he likes to think of the cool, cool days of bear hunting.

Knowing where there was a cub grizzly chained up, he meandered away from the cares and worries of business to refresh his memory as to the habits of the said cub. The poor beast had got the chain somewhat in a twist, which made its rambling space a little limited; but it suddenly began playing a few antics, which resulted in the chain becoming untwisted.

Without a word of warning bruin took a leap at Sid, which gave him a longing desire for his trusty gun. It was certainly a narrow escape for Sid. Somebody ask him about this adventure.

Bertie Ward, the worthy estimator at Messrs. Fiddes & Hogarth, Ltd., 122 King East, Toronto, has gone into the farming business on the side, and many an hour is spent in blissful oblivion away from Ts. 45 and 90 Ells, T.Ys. and offsets. Bertie thinks there's no better "Y." to "offset" the cares of an estimator than ON THE FARM.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



PATTERN FOR TAPER ELBOW.

Editor "Sanitary Engineer"—Please inform me in your next issue how to lay out a pattern for a taper elbow. I find the course on sheet metal very instructive, and hope it will be continued. I do not happen to have seen a pattern of taper elbow, so hope you can oblige.

Yours truly,

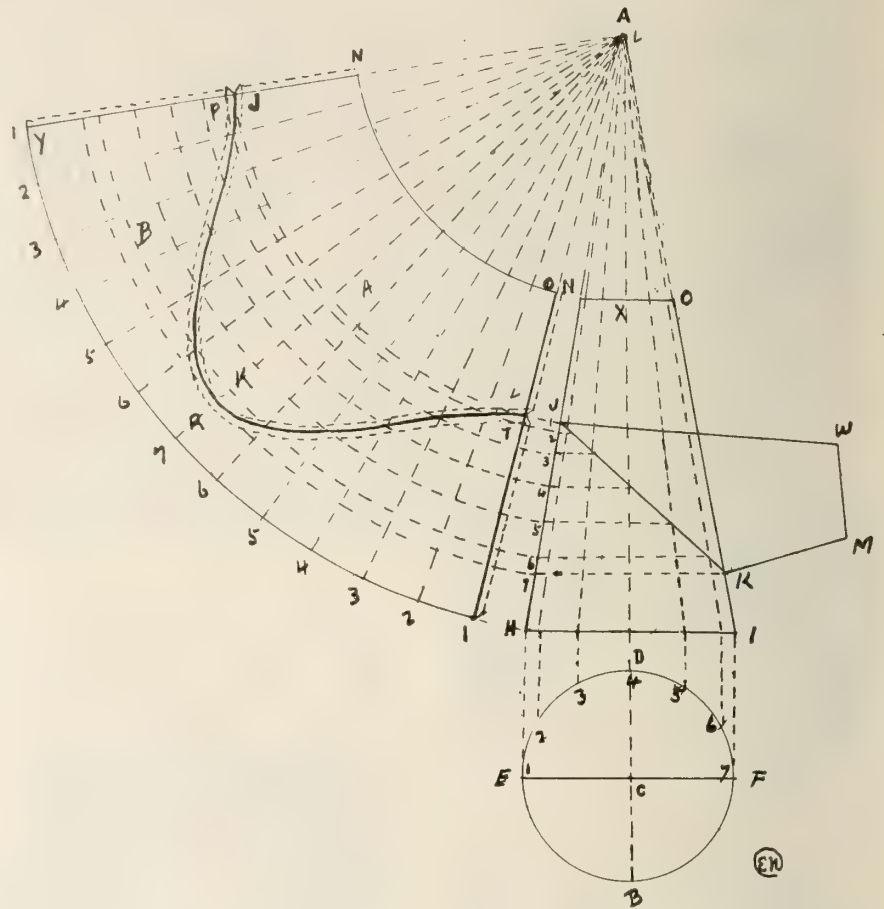
A CONSTANT READER.

Replying to Constant Reader, we herewith have pleasure in showing lay-out of taper elbow—

Draw a vertical line A.B. Then make C a centre of the diameter of whatever size of largest end of elbow and described as at B. E. D. F. Then draw a line at right angle with A. B. Draw another line to describe bottom of elbow as at H. I., being perfectly parallel with points of circle at E. F. These lines H. I. and E. F. will be the pre-determined size of desired elbow.

Then measure from line H. I. to X., which is to be the total length of the elbow. Then again at X. draw a parallel line N. O., this being the diameter of the small end of elbow. Having determined the lines N. O. H. I. draw lines from H. N., allowing this line to intersect A. B., which will determine centre L. Then draw another line from I. to O. and also intersect at L. Then L. becomes the centre for arc of pattern.

Then divide the half circle at E. D. F. into equal parts numbering 1, 2, 3, 4, 5, 6, 7, as shown. From these points draw 7 vertical lines up to line H. I. From these points erect 7 lines up to the centre L. on A. B. Then place the compasses at L. and draw an arc from O to N. Having drawn arc O. N., determine what length the throat of the large end of the elbow is to be and make first arc, viz., from I. to K. From those points draw another parallel line at K., and measure the dotted lines which have intersected H. I., transferring said distances upwards on the elevation line beginning at 7, 6, 5, 4, 3, 2, 1. Now, take the compasses and draw 7 arc lines, beginning at 1, 2, 3, 4, 5, 6, 7. Having done this, draw the mitre line from J. to K. and from K. to L.



To draw a plan of the elevation take a piece of tracing paper and place it over the pattern at N. O. H. I., and trace lines from J. N. O. K., and reverse the tracing so that K. will cover J., this will give you exact view of what elbow will look like when finished. Of course any size of taper or reducing elbow should be developed in exactly the same way.—Editor.

PIPE SIZE TO A RADIATOR.

Editor, Sanitary Engineer.—Can I put a 40-foot radiator on a $\frac{3}{4}$ in. pipe—it's a hot water job—and get good heating results?—Owner.

It depends upon the location of the radiator as to the distance from the boiler. Under ordinary circumstances and

on a gravity job we should consider it rather doubtful.

With a pressure job the radiator should heat all O.K. if the pipes are reamed thoroughly.—Editor.

POSITION OF HEATING TANK.

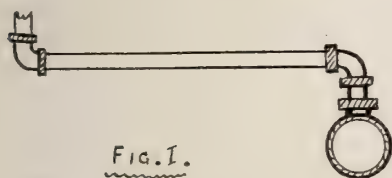
Editor, Sanitary Engineer.—Does it make any difference in the working of a range boiler as to whether it is placed vertically or horizontally?—C. R. Rose.

No, provided you don't get any traps on your connecting pipes. If the tank is placed below the water front, a manner must be provided that will force the circulation down into the tank. A loop generally accomplishes this purpose.

Some ranges are so made that the tank can be placed horizontally over the range.—Editor.

Roughing in Risers for Steam or Hot Water

One thing that causes lots of trouble between the master and journeymen is the slowness and incorrectness with which the risers are put in. Also the branches, which, however, depend more or less on the manner in which the main stacks up from the measurements.



It seems foolish to mention such a small point; but fitters commit this mistake very commonly, and so it's well to guard against the point.

In running the branches from the main to the risers, many fitters do the job after the fashion shown by Fig. 1. Now, while this will work all right, there is always a chance that the pipe gets trapped or hung up dead level, which is a point to be fought shy of.

A safer and more mechanical way is represented by Fig. 2, and by using a pitched ell at the end one can rest assured that there will be a slant on the pipe every time. There must be, or the riser can't be plumb.

By using a little common sense in planning the cutting of the wood work, using some of the suggestions offered in this article, it becomes a very easy job to rough in the risers, a point that many fitters dislike.

In testing out the work it can be done with air or water. The writer prefers water when the weather is not too cold, and a pressure of anywhere from 25 to 75 pounds will give a good test. If the work is well done, care used in selecting the fittings and pipe, there ought not to be a single leak on the roughed in work.

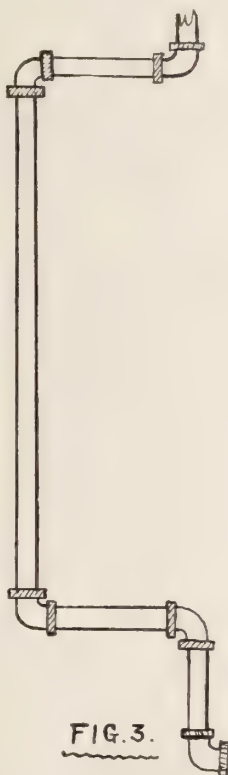
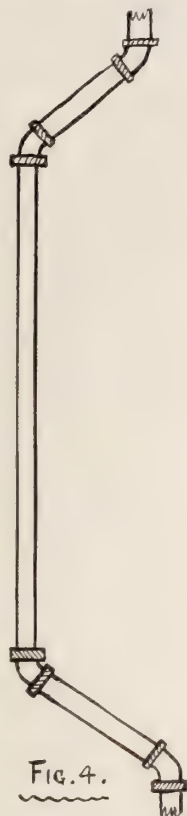
The stub caps must be loosened when the water is turned on in order to let the air out of the pipes. The stubs through the floor should be cut the proper length for the radiator valve, as it is a loss of time to slap them in any old length, only to have to remove them and cut them out. The concealed risers should be covered with pipe covering when they are run on an outside wall. All the pipes should be reamed in order to give the full size of the pipe.

A few years ago a man was regarded as the next thing to crazy if he put the heating risers behind the lath and plaster.

Now he is regarded the same way if he don't, in case he has the chance; and it can be done behind the finished work, provided the owner is willing to pay

something extra for the trouble involved in so doing.

In running risers, it is decidedly bad

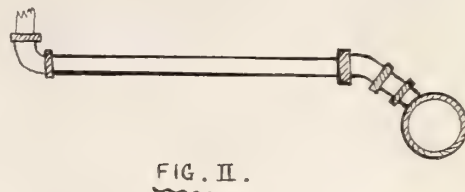


practice to make square or right angle turns when off-setting, as shown by Fig. 3.

A much better manner is illustrated

in Fig. 4. This applies to both steam and hot water heating. In either case there will be no traps or hold up in the circulation in Fig. 4, while there might be (and generally is) in Fig. 3.

In measuring for the risers, the handiest appliance the writer ever got



hold of was a 12-foot extension stick. This telescoped to 6 ft., and with it one could quickly measure from cellar to second storey while standing on the first floor, and get risers correct length every time in a light or dark room. Steam-fitters will appreciate this point. Beginners won't. In many cases and for various reasons it becomes necessary to splice the risers. Now a pipe coupling in plain sight, anywhere from four to six feet from the floor, is an eye sore, and displays poor judgment on the fitter's part. It should be placed on a line with the baseboard—about 10 inches up from the floor. In that place it will hardly ever be seen, or may be hidden by some piece of furniture.

In running risers in pairs for hot water don't bring them too close together, because if you do there will not be room for the floor and ceiling plates.



D. W. Rose, the genial representative of the Gurney Foundry Co., Limited, never misses an opportunity to talk shop. He is a whirl-wind business maker. Here he is seen demonstrating the merits and



workings of the Economizer that goes with every Gurney Oxford Range and Oxford Hot Water Boiler to Mr. Rich, of Noble & Rich, London, and has selected a quiet and restful spot.

The Efficient Training of Sanitary Engineers

A very interesting and instructive article, one which should be read by all who are engaged in the craft—Professor Whipple further promises to furnish "Sanitary Engineer" with a prospectus of their studies at a later date.

By GEORGE C. WHIPPLE, Professor of Sanitary Engineering in Harvard University.

Within the last quarter century a new profession has come to the fore—sanitary engineering. It represents the application of a new science to a new product of civilization. The new science is bacteriology; the new product of civilization is the modern city.

How important sanitary engineering is to the world to-day is scarcely realized, so gradual has been its evolution, but its importance may be appreciated by comparing the conditions of life in our cities to-day with the conditions that existed in ancient days, or even a few generations ago.

The world has always had its cities. Man is a gregarious animal. The cities of long ago developed to their limit and then fell into decline, and in many instances disappeared altogether. Sometimes they were destroyed from without by their enemies; sometimes they fell victims to the cataclysmic forces of nature; but often they fell from more insidious causes—from diseases that swept through their inhabitants until great aggregations of people were reduced to mere handfuls, and those that remained were scattered through fear and starvation.

Two potent factors limited the growth of ancient cities—lack of transportation and ignorance of what constitutes hygienic environment. Without adequate transportation the food of cities was limited to local supplies. If these failed famine followed and the people fled to where the food could be found. Coast cities could receive supplies by water and some of the old maritime cities long maintained their supremacy, but large inland cities as we have them to-day were formerly unknown. Without knowing how to control transmissible diseases, with no better theory than that they represented the visitation of an angry Providence, no wonder that famine was followed by pestilence and that as cities became more crowded the wider was the spread of the dread calamity.

Our modern cities, far greater in number and size than ever in the world's history, are made possible first, by the development of transportation by road and rail and fast steamships, so that food from afar may be brought to the homes of the urban dwellers; and, second, by the development of the arts of sanitary engineering, by which the peo-

ple are supplied with pure water and pure air, and the waste products of life safely and inoffensively removed. Other influences, of course, have contributed, but among them all the work of the sanitarian is conspicuously successful and conspicuously modern.

To give a simple, adequate definition of sanitary engineering is difficult. From an early application to plumbers and expert drain layers, the term has grown in importance as the works have grown in magnitude, until it now includes civil engineers engaged in providing public water supplies, sewerage systems, garbage disposal works, methods of cleaning streets and draining swamps, as well as engineers whose interests are chiefly indoors and who are engaged in providing systems of plumbing and ventilation for buildings. If the civil engineer be defined as "he who adapts the great forces of nature for the use and convenience of men," the sanitary engineer may be correspondingly defined as "he who adapts the forces of nature to the preservation of the public health, through the construction and operation of engineering works."

The problems of the sanitary engineer are so vast and so varied, they bring him into contact with so many branches of science and with so many classes of people, that an exceptionally broad education is demanded. Engineering is fast coming to be regarded as one of the learned professions and the education required of one who enters this profession must be not only scientific and technical, but broad and humanitarian. He must not only know the underlying principles of the mechanical sciences, but if he is to become the director of great enterprises he must have the power to think logically and reach conclusions quickly, write clearly and speak forcibly—not to mention such moral qualities as honesty, enthusiasm and that vague something termed "personal magnetism." Some of these qualifications are inherent in the individual; some come with experience; but the power to think and speak and write can be acquired by study and practice. It is partly because of this need for broad-minded engineers and partly because science itself is becoming so broad and its branches so interwoven, that the applied sciences are being taught more and more as graduate

courses in our universities, and that the technical schools are looking forward to longer courses than the usual period of four years. This need of an extended education is particularly true of sanitary engineering, for more than some of the other branches of engineering it requires the aid of many sciences. Not only must the sanitary engineer be versed in mathematics and mechanics, but he must have a working knowledge of parts of chemistry, biology, bacteriology, microscopy, meteorology, geology, hygiene, preventive medicine, vital statistics. Unlike other branches of engineering, sanitation is concerned not alone with iron and stone and other inert building materials, but with organic matter and living things. The purification of water and sewage is due largely to biological action, and the knowledge of bacterial processes is scarcely less important to the sanitary engineer than that of the laws governing the flow of water in pipes and the strength of materials.

While this is acknowledged it is also true that first and foremost the sanitary engineer must be an engineer, and the collateral science must be subordinated. Hence, the student must be trained primarily in engineering and, secondarily, in sanitation. The emphasis is important. It cannot be successfully reversed.

Sanitary science teaches the student why this or that structure is needed, but it does not teach him how to design or construct, and these are for him the very fundamentals of his profession. The wisely arranged curriculum will, therefore, cover the field of sanitation in a broad and general way, without taking too much of the student's time from his detailed studies in structures and hydraulics.

But sanitary science is becoming so important that there is room not only for the constructing engineer, but for the sanitary specialist and for him whose duty it is to operate the works after they are built, to take charge of the water filters and the sewage treatment plants, to manage the garbage works and superintend the cleaning of the streets and buildings. Such men need a slightly different training from others, and the ideal course would give less attention to civil engineering features and more attention to mechanical engineering and laboratory work. Also

more attention should be given to the subject of accounting and scientific management. This need for capable managers of sanitary works will soon be a pressing one, and our technical schools must be prepared to furnish men for this service.

Besides the sanitary engineer and the specialist in sanitation, the world to-day needs—and the need is very great—a kind of man just beginning to make his appearance, namely, the sanitary executive, or, as he is more often called, the health officer. There are already many so-called health officers serving on boards of health or employed by them. Some of these men are great leaders, well worthy of the honorable positions they hold, but the rank and file of them are ill-fitted for their important task. Our public health machinery was installed when the hygienic wisdom of the town was wrapped up in the family doctor and when the physician was the logical custodian of the public health. With the growth of the science of bacteriology and preventive medicine and the application of engineering, all this is changed. The ability to diagnose a case of smallpox and keep a record of deaths is no longer a sufficient qualification for the health officer of even a village, while the growth of our cities is making it increasingly necessary that the men in charge of the public health of so many people shall be experts in their line.

Medical training alone does not fit men for this service. The problem of curing disease is quite different from the problem of preventing disease. The former deals with human beings as individuals; the latter considers them as units of a mass. The prevention of disease involves mathematics; statistics relating to the sick and the dead must be constantly and daily used in order to show what forces of disease are at work, and where the attack is next likely to be made. It involves engineering; for the public must be protected against impure air and infected water; streets must be cleaned and garbage removed. It involves chemistry; for the public must be protected against the sale of adulterated and poisonous foods. It involves bacteriology; for infectious diseases must be diagnosed and anti-toxins provided. It involves law; for the health officer must be able not only to discern evils but to eradicate them. But the duties of a health officer should not be entirely repressive and punitive. There is a positive side. His department should be an educational force in the community, constantly instructing the people in the arts of hygiene and in the principles of right living. Many believe that this educational function of the

health officer is one of the most important of his duties.

As an illustration of modern tendencies in the training of sanitary engineers, mention may be made of the newly established courses in the School of Engineering, Harvard University.

Here sanitary engineering does not lead to a special degree, but is considered as a branch of civil engineering; in fact, all students in civil engineering are expected to take the general course in this subject. The same course is also open to candidates for the degree of Doctor of Public Health in the Medical school. For those who intend to engage in sanitary work at once after graduation, courses in water supply engineering are offered during the last term, and in these the students receive such detailed instruction as will fit them for the actual kinds of work that will be expected of them in practice.

This instruction is not given as classroom exercise, but as individual work carried on as it would be in the office of a practising engineer. Much, too, is made of the study of actual works in operation for the benefit of those who intend to enter this field. The extent to which specialized subjects in sanitary engineering should be taught is a difficult matter to decide. Generally speaking, experience has shown that specialization in our technical schools has been carried somewhat too far. In the writers' opinion it ought to be carried only far enough to incite the permanent interest of the student and enable him, on graduation, to take up some particular line of work intelligently, and with such a degree of skill that he can earn a reasonable income during the early years in which he is getting his real experience in his chosen profession. In later years it is the effect of his general studies rather than of his special studies that make for his success. In other words, it is mental culture, after all, that counts.

One feature of interest in connection with the Harvard School of Engineering is the fact that it continues through the entire year, utilizing the time usually devoted to the long summer vacation. This enables the student to accomplish his engineering studies and obtain his Master's degree in two full years after receiving his Bachelor's degree. The summer work is of particular advantage in the study of certain phases of sanitary engineering, as it enables field work to be carried on at a season when the biological processes are at their maximum, and when material for study is readily available.

From the Harvard School of Engineering, one of the latest to take up this field, let us turn to the Massachusetts Institute of Technology, a pioneer in American sanitation. Since 1889 near-

ly a hundred men have taken the Bachelor's degree in sanitary engineering, chemistry and biology have taken up sanitary work. The influence that these men have had on the public health of our country cannot be measured, but the lives that have been saved by the works they have built are numbered by thousands and by these works our cities are being made cleaner and better and safer places in which to live. The American cities owe a debt to the Massachusetts Institute of Technology and the other universities that they can repay only by their most cordial and generous support.

Sanitary engineering is yet in its youth. Its practice is far from being crystallized. More than other branches of civil engineering, therefore, it demands research. Half a million dollars has been spent in this direction by our states and municipalities, but the research carried on by our universities has not been as great as might be expected. Additions to university funds for this purpose would bring important results. Immense sums have been given as endowments for research in the cure of disease and in preventive medicine. But it has hardly yet become realized that the great life-saving agencies are carried out by engineers, and that by improving the engineering arts vast sums of money may be saved. Our country is justly proud of the work of the United States Government in preventing disease at the Isthmus of Panama, and in showing how the tropics may be safely inhabited by white men, but this work has been very expensive. The next step in advance is for the sanitary engineer to accomplish the same task at greatly less cost. This step is absolutely necessary. Research in sanitary economy is, therefore, one of the directions in which money may be well spent during the next decade.

The demand for young sanitary engineers is continuous and increasing. There is little doubt but that men who enter this field will find useful service and a competent livelihood. This is ample reason for a young man to study this subject. But there is another reason inherent in the training itself. A piece of iron to be welded into a useful tool or a thing of beauty must be heated white hot and then hammered into shape. So a student must be first inspired until his enthusiasm glows; then he must receive the blows that will shape his mental processes so that they will follow naturally along the track of sound logic and sane thinking. No better combination exists for producing this result than the inspiration to be derived from the wonderful prospect of a world saved by sanitation, and the hard mental work required of him who would be a sound and competent engineer.

New Canadian Patents

Warren F. Drew, Bordentown, New Jersey, U.S.A., 6th May, 1913; 6 years. Filed 28th February, 1913. Receipt No. 177,445. Assignment No. 71,302, 1st August, 1913, to Rotico Fitting and Supply Co., New York, N.Y.

Claim 1.—A flush tank having an outlet aperture, a single valve adapted to control the aperture, a float adapted to be supported on the water in the tank and means actuated directly by the float to close the valve as the float is lowered and to open it momentarily as the float begins to rise.

2.—A flush tank having an outlet aperture, a single valve adapted to control the aperture, a float adapted to be

is raised past a predetermined point.

3.—A flush tank having an outlet aperture, a single valve adapted to control the aperture, a float adapted to be supported on the water in the tank and means actuated directly by the float to close the valve as the float is lowered, and to open it momentarily as the float is raised, in combination with manually operated means for opening the valve.

4.—A flush tank having an outlet aperture, means for supplying the tank with water, a valve adapted to control the outlet aperture, manually operable means adapted to open the valve to allow the water in the tank to be discharged through the aperture, a float supported on the water and automatic

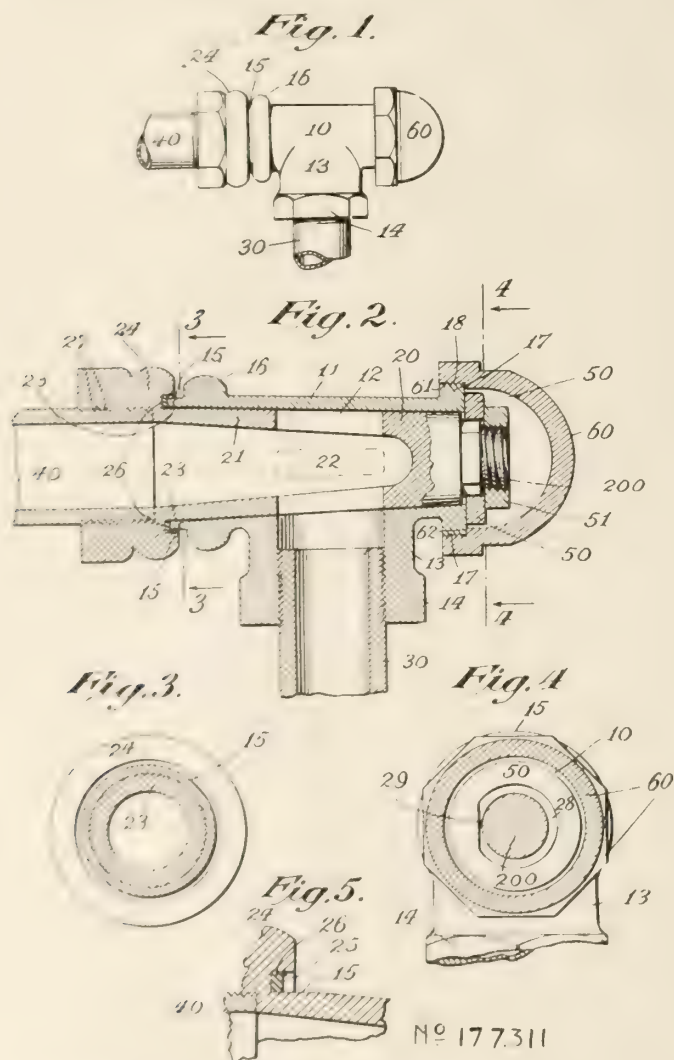
mentarily opened when the float is raised.

5.—A flush tank having an outlet aperture, means for supplying the tank with water, a valve adapted to control the outlet aperture, manually operable means adapted to open the valve to allow the water in the tank to be discharged through the aperture, a float supported on the water and automatic means actuated directly by the float whereby the valve is caused to close when the float is lowered to a predetermined point, and is caused to be momentarily opened when the float is raised, in combination with means for adjusting the point of the first closure.

6.—A flush tank having an outlet aperture, means for supplying the tank with water, a valve adapted to control the outlet aperture, manually operable means adapted to open the valve to allow the water in the tank to be discharged through the aperture, a float supported on the water, and automatic means actuated directly by the float whereby the valve is caused to close when the float is lowered to a predetermined point, and is caused to be momentarily opened when the float is raised, and is caused to be fully opened when the float is raised to a further point.

7.—A flush tank having an outlet aperture, means for supplying the tank with water, a valve adapted to control the outlet aperture, manually operable means adapted to open the valve to allow the water in the tank to be discharged through the aperture, a float supported on the water, and automatic means actuated directly by the float whereby the valve is caused to close when the float is lowered to a predetermined point, and is caused to be momentarily opened when the float is raised to a predetermined extent, and is caused to be opened when the float is raised to a further point, in combination with means for adjusting the point of such last opening.

8.—A flush tank having an outlet aperture, means for supplying the tank with water, a valve adapted to control the outlet aperture, manually operable means adapted to open the valve to allow the water in the tank to be discharged through the aperture, a float supported on the water, and automatic means actuated directly by the float whereby the valve is caused to close



No 177,311

supported on the water in the tank and means actuated directly by the float to close the valve as the float is lowered, and to open it momentarily as the float

means actuated directly by the float, whereby the valve is caused to close when the float is lowered to a predetermined point, and is caused to be mo-

when the float is lowered to a predetermined point, and is caused to be momentarily opened when the float is raised, and is caused to be opened when the float is raised to a further point, in combination with means for adjusting the points of the first closure and second opening.

9.—The combination with a valve body, of a vertically movable valve stem, a substantially vertically movable link, means for moving the link, a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position it and the valve stem are in line.

10.—The combination with a valve body of a vertically movable valve stem, a substantially vertically movable link, means for moving the link, a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position it and the valve stem are in line, and means for locking them into such position.

11.—The combination with a valve body, of a vertically movable stem, a substantially vertically movable link, means for moving the link, a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position, it and the valve stem are in line, and means for locking them into such position, including a latch.

12.—The combination with a valve body, of a vertically movable stem, a substantially vertically movable link, means for moving the link; a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position, it and the valve stem are in line, and means for locking them into such position, including a latch jointed to the link and the valve stem.

13.—The combination with a valve body, of a vertically movable valve stem, a substantially vertically movable link, means for moving the link; a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position, it and the valve stem are in line, and means for locking them into such position and unlocking them therefrom.

14.—The combination with a valve body, of a vertically movable valve stem, a substantially vertically movable link, means for moving the link; a jointed connection between the link and the valve stem, whereby when the link is in its uppermost position, it and the valve stem are in line and means for locking them into such position and means for unlocking them therefrom, including a water supported float.

15.—The combination with a valve body, of a vertically movable valve stem, a substantially vertically movable link,

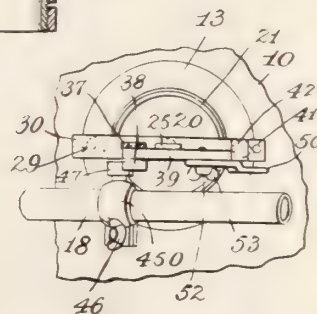
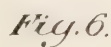
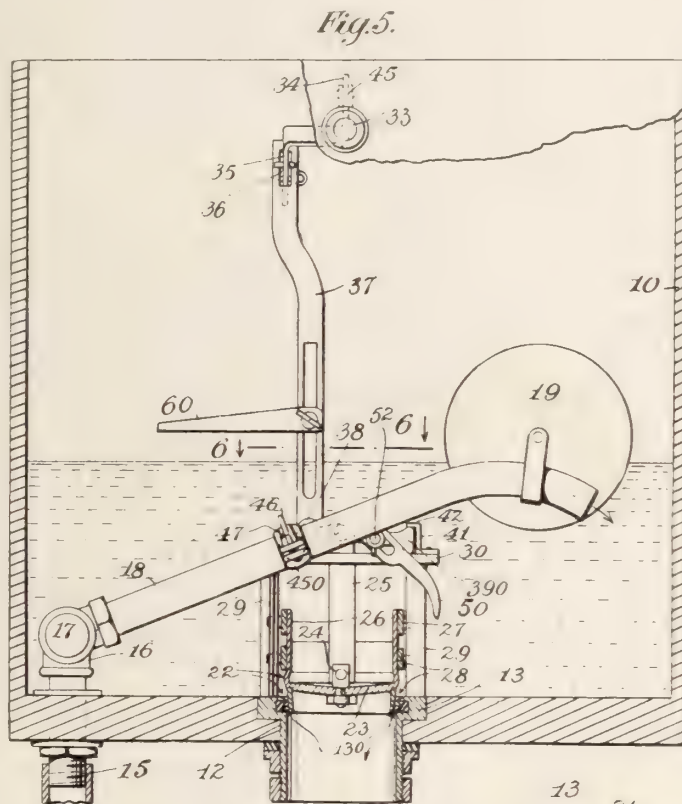
means for moving the link; a latch lever jointed to both the link and the lever, and means for supporting the latch lever when in a vertical position.

16.—The combination with a valve body, of a vertically movable valve stem, a substantially vertically movable link, means for moving the link, a latch lever jointed to both the link and the lever, and means for supporting the latch lever when in a vertical position, and means for moving it away from said support operated from a float.

17.—A flush tank, an outlet aperture therein, a vertically movable valve adapted to control the same, a float within the tank, a stem for the valve, means for manually moving the same, including a substantially vertically movable link, a jointed connection between the link and the valve stem, whereby when the link is moved to one position the link and valve stem are in vertical line; a latch moved by the jointed connection into a vertical position when

adapted to control the same, a float within the tank, a stem for the valve; means for manually moving the same, including a substantially vertically movable link; a jointed connection between the link and the valve stem, whereby when the link is moved to one position the link and valve stem are in vertical line; a latch moved by the jointed connection into a vertical position when such alignment occurs, and means for supporting the latch in such position, and means for moving the latch from such position actuated from the float.

19.—A flush tank, an outlet aperture therein, a vertically movable valve adapted to control the same, a float within the tank, a stem for the valve, means for manually moving the same, including a substantially vertically movable link; a jointed connection between the link and the valve stem, whereby when the link is moved to one position the link and valve stem are in vertical line; a latch moved by the jointed con-



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such alignment occurs, and means for supporting the latch in such position.

18.—A flush tank, an outlet aperture therein, a vertically movable valve

nection into a vertical position when such alignment occurs, and means for supporting the latch in such position and means for moving the latch from

such position actuated from the float, in combination with means for varying the point at which such movement will take place.

Warren F. Drew, Bordentown, New Jersey, U.S.A., 15th July, 1913; 6 years. Filed 24th February, 1913. Receipt No. 177,311. Assignment No. 71,303. 1st August, 1913, to Rotico Fitting and Supply Co., New York, N.Y.

Claim 1.—A valve, comprising a conical plug, provided with a reverted flange to form an external annular groove; a casing having a conical bore adapted to fit loosely over the plug, and the end of which fits in the external annular groove; an elastic packing in the groove and means, as a retaining nut, for holding the casing against the plug.

2.—A valve, comprising a plug having a centrally-disposed bore extending partially through it; a port extending laterally from the bore to the outside of the plug; a casing adapted to surround the plug, and having an aperture registering with the plug port, an external packing groove being formed on the plug and adapted to receive one end of the casing, which is held in engagement with the plug by a retaining nut.

3.—A valve, comprising a plug having a centrally-disposed bore extending partially through it, and a port leading from the bore to the outside of the plug; an enlarged extension formed integrally with the plug and turned back to form a packing groove between its inner wall and the outside of the plug; a casing adapted to fit over the plug, and one end of which is adapted to fit into the packing groove; an opening in the casing registering with the plug port, and a retaining nut for holding the plug and casing together.

SANITARY INSTITUTE.

British Columbia Branch is Organized —Sanitary Congress to Be Held in October.

A meeting was held on Thursday evening in the McGill University College, Vancouver, to inaugurate a British Columbian Branch of the Royal Sanitary Institute, which has twenty-seven fellows, members and associates in British Columbia, and its headquarters in London, England.

The objects of the Royal Sanitary Institute are the advancement of hygiene, the promulgation of the principles of hygiene in popular form to the people, and the training and certification of sanitary inspectors, meat, smoke and other inspectors, school nurses and lady health

SARNIA'S INTAKE PIPE.

Sarnia, Sept. 3.—The town at present has a diver and tug at work making an examination of the water works intake pipe. It appears that the pipe has become opened at some of the joints, thus allowing large quantities of bad water and sand to get into the drinking water. The pipe was put in good shape about a year ago, but it is thought that a dragging anchor must have caught in it.

NEW CATALOGUES.

The Chicago Pump Company has just completed their new Catalogue D, 1913-1914, which describes their Automatic Electric Condensation Pumps, which they claim are the finest on the market to-day. The drawing and illustrations are a work of art, and should be procured at once. It is seldom that the trade have the opportunity offered of receiving a book such as this, which gives such fine information in an illustrated manner. The Chicago Pump Co. will be pleased to furnish any information desired, and will mail one of these catalogues upon request.

NEW BOOKS.

"Heating Engineers' Companion" is the title of a pocket size book recently issued by the Gurney Foundry Co., Ltd., Toronto. It contains about 120 pages of the most valuable information it is possible to wish for by the heating engineer.

Amongst the few problems which are embodied in this book are: Vacuum steam heating, air line systems, electric vacuum pump, greenhouse heating, data on chimney sizes, and a hundred-and-one useful helps, and can be obtained free by applying to the Gurney Foundry Co., Ltd., Toronto.

The American School of Correspondence have issued a new bulletin, which gives their readers a very clear idea of the work they are doing to help to raise the standard of the working mechanic, better fitting him for higher positions, as well as increasing his efficiency in his present situation, thus making his labor power more valuable.

MEDICINE HAT ENTERPRISE.

An agreement has been signed between the Medicine Hat City Council and the Dominion Sanitary Fountain Co., Ltd., capitalized at \$100,000, by which the latter agrees to erect a plant

valued at \$15,000 and employ from 10 to 15 men in making sanitary drinking fountains. The city made the usual concessions. The company has a factory in Spokane and other United States cities.

NEW TOWN HALL FOR COBALT.

F. R. Gibson Secures Contract for Sanitary and Heating Engineering.

The contract for the heating, plumbing, and wiring of the new town hall has been awarded to F. R. Gibson, of Haileybury. Four tenders were received, and while Mr. Gibson's was not the lowest, there was only a difference of about \$20, and he was awarded the work because he was well known. The tenders were:—A. Archambault, \$5,900; Thomas Crick, \$3,790; F. R. Gibson, \$2,435, and James Murphy, New Liskeard, \$2,415.

WILL INVESTIGATE BREAK.

Tug and Diver to Work on Sarnia's Intake Pipe.

Sarnia, Sept. 7.—The tug Sarnia City, of the Reid Wrecking Company, has been employed by the city along with a diver to make an examination of the waterworks intake pipe which extends out under the river several hundred feet. It is thought that some dragging anchor has caught hold of the pipe which is not protected, and opened some of the seams. The pipe was repaired only a year ago when a big break was discovered. A double quantity of chlorine is being used to keep the drinking water in good shape.

TRADE NOTES.

Edmonton.—J. M. Holt has been succeeded in his plumbing and heating business by Holt & MacDonald.

F. T. Rawley, Canadian manager of Honeywell Heating Speciality Co., spent several days in Toronto. Mr. Rawley is also the New York representative of the aforementioned company.

The Imperial Foundry Co., Ltd., of Milton, are erecting a large and up-to-date building, which is to be 260 ft. long and 65 ft. wide. Their present premises are far too small.

This factory has lots of room for extension, and is being built with that in view. It is situated close to the C.P.R. tracts, and the company own 5 acres of land for said extensions. They expect to spend at present from \$30,000 to \$40,000.

Complete Course of Sheet Metal Work

By L. W. KOSER

(Continued from September 1st issue.)

Extend the line C-D, Fig. 1, on either side for a base line for the triangles.

Erect the line X-Y.

From Y lay out each of the full lines of the head piece as N-J, 2-2, etc., shown by Y-J, Y-2, etc.

Now erect the line O-P and from the P lay off each of the dotted spaces as shown by P-2, P-3, etc.

Now carry vertical lines from J-2-3-4-5 and I of the outside curve, Fig. 2, up until they cut the line A-B of Fig. 1.

Then carry horizontal lines from each of these points out to the lines Y-X and P-O.

Then draw full lines from each of the

points on X-Y to the points on the base line having the corresponding number.

Then draw dotted lines from each of the points of the line O-P to the point on the base line having the next highest number; this gives the diagram of full and dotted lines for the head piece.

Develop the diagram of triangles for the tail piece in the same manner.

The outside line of the plan is not a correct plan of the top rim of the tub as this top rim, it will be noticed by A-B, Fig. 1, is on a slant. Therefore, before developing the pattern it becomes necessary to get a correct plan of this top.

Above A-B, Fig. 1, draw a line H-J parallel to A-B.

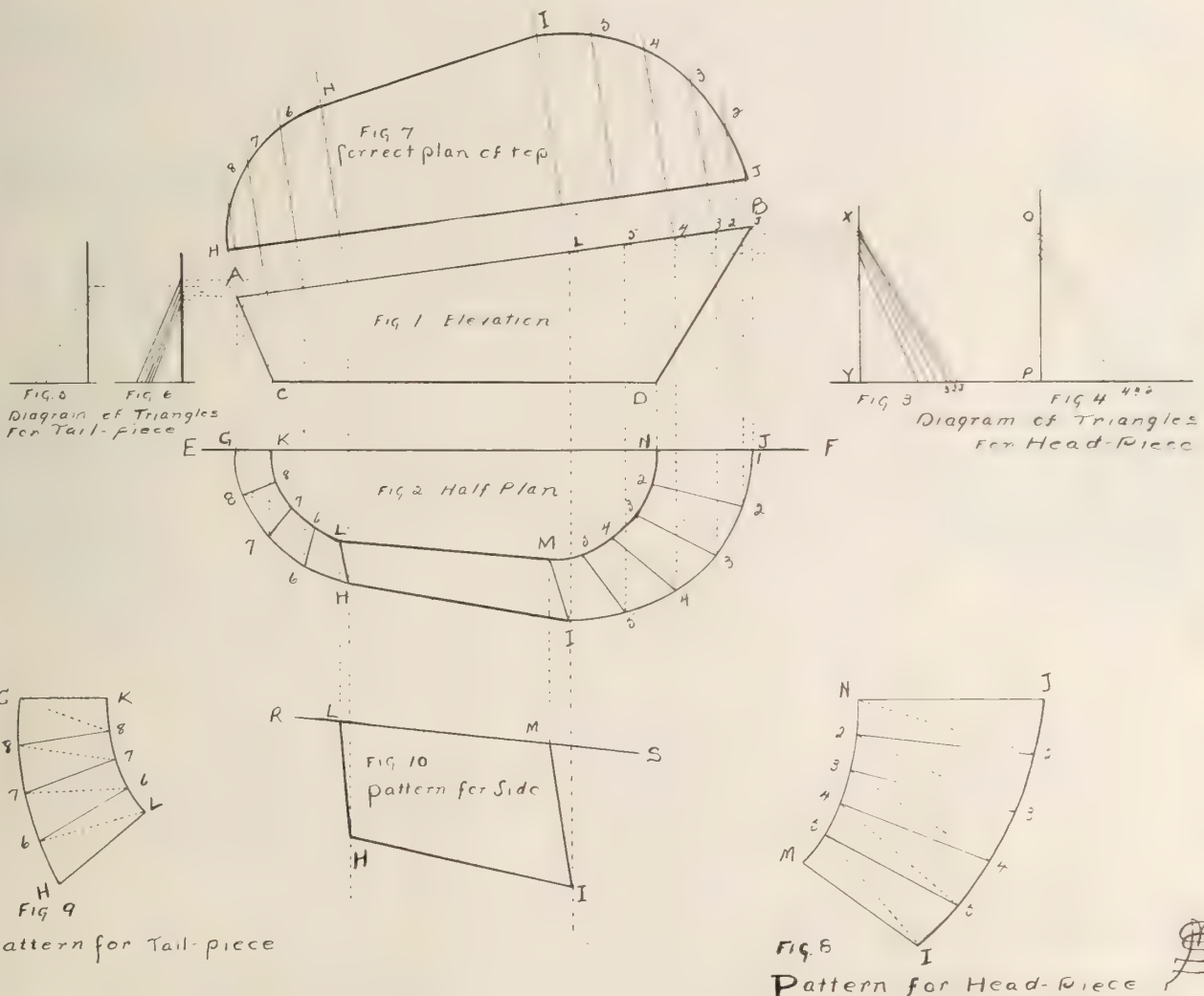
Carry a line from each of the points on A-B and at right angles to it, cutting the line H-J of Fig. 7 and extending up indefinitely, make the perpendicular distance from the point to the line H-J of Fig. 7 equal to the perpendicular distance point 2 is from the line E-F of Fig. 2.

Likewise make each of the other points on Fig. 7 the same distance from the line H-J as they are from the line E-F of Fig. 2.

The patterns for the head and tail pieces are now developed the same as the transition piece in the last lesson.

PATTERNS FOR BATH TUB

33



To get the pattern for the side draw a line as R-S, making it parallel to the bottom line of the plan L-H, Fig. 2.

Drop vertical lines from point L and M, Fig. 2, until they meet this line.

Also drop vertical lines from point H and I, Fig. 2, cutting through R-S and extending down indefinitely.

Set the compass to H-I of Fig. 8 and with M, Fig. 10, as centre, cut the dotted line at I. Connect H-I.

In the same manner make L-H of the tail end equal to L-H, Fig. 9.

Allow for flanges and folds.

On plate 34 we show how to develop the pattern for the "prongs" of a three-prong tapering joint used where it is desired to carry off three smaller pipes from a large main, a perspective view being shown at Fig. 9.

Fig. 1 shows a plan view in which the

large circle A-B-C represents the main pipe and B-O-C-S-D one of the prongs.

Fig. 2 shows one of the prongs in elevation; the line U-13 represents the width of diameter of the large pipe. The quarter circle U-X, the profile or elevation through 10-C of the plan.

The line X to 10 represents the mitre line. X-1-7-13 and 10 represents a side view in elevation of one of the prongs while Fig. 5 shows a half profile of the small end.

Fig. 6 is a diagram giving the true length of the solid lines.

Fig. 7 shows a true length of the dotted lines while Fig. 8 shows the pattern for one half of one prong, the other half being the same.

First draw the plan as follows:—

Draw the large circle the diameter of the large pipe.

Draw the horizontal line A-O-P-R representing the centre of one of the prongs.

Draw the line S-D at right angles to this and make it the desired diameter of the small end of the prong.

Divide the half circle into three equal spaces locating points C and B, from which draw lines to the centre O and to the small ends O and S.

Project a dotted vertical line from points A-O and P and at any convenient distance above the plan draw the horizontal line U-V-13, Fig. 2, representing the top of the large pipe where the prongs spring from.

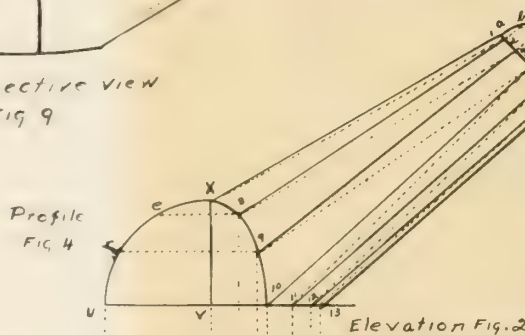
At V erect the line V-X, making it equal to U-V.

Draw the quarter circle U-X.

Draw the arm of the prong X-1-7-13 and at the small end draw a half circle



Perspective view
FIG. 9



Profile
FIG. 4

Elevation FIG. 2

End Profile
FIG. 5

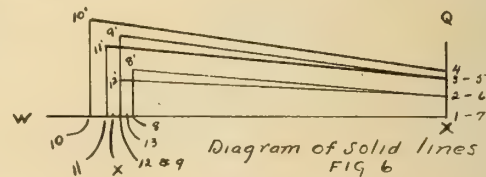


Diagram of solid lines
FIG. 6

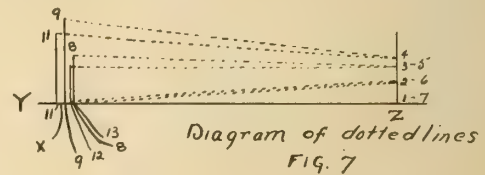
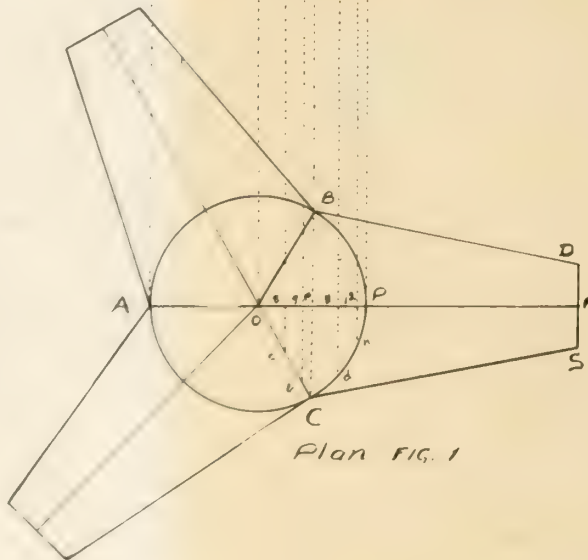
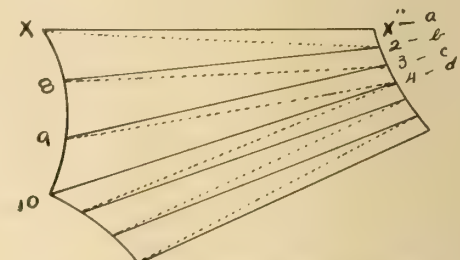


Diagram of dotted lines
FIG. 7



Plan FIG. 1

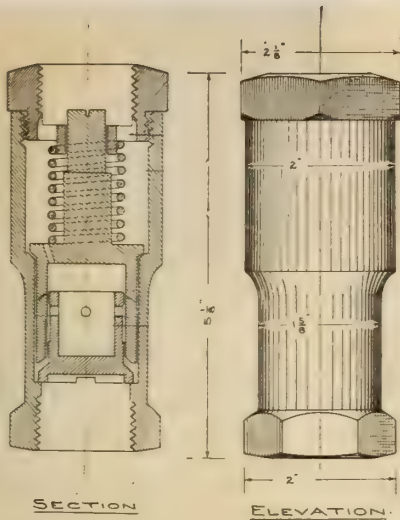


Pattern FIG. 8



PATTERN FOR A THREE-PRONGED TAPERING PIPE JOINT.

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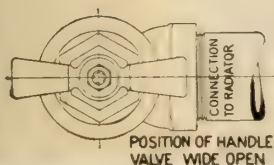
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Fig. 450



Fig. 451



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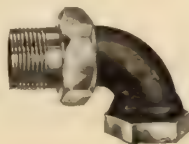
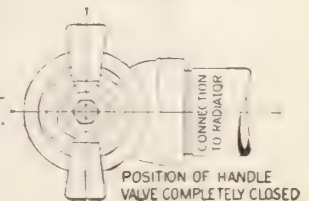


Fig. 452

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equal to the diameter of the small end.

Divide this half circle or end profile off into equal spaces and as shown by a-b-c, etc., and carry lines at right angles to the line 1-7 from each of the points a-b-c, etc., to the line 1-7.

We now want to get the mitre line X-10-13, so we proceed as follows:—

Divide the quarter circle U-X, Fig. 2, off into three equal spaces and letter same as shown by c-e.

Project horizontal dotted line from C and E through and past the centre line V-X.

Now take the distance that e is from the centre line X-V and lay this off from O on the line O-C of Fig. 1 as shown by O-a.

Also lay off the distance from C to the line X-V as shown by O-b, Fig. 1.

Project vertical lines from a and b, Fig. 1, until they meet the horizontal lines drawn from e to c, Fig. 2.

A line traced through these intersections from X to 10 gives the mitre line for the prongs to join each other.

Divide the curved line C-P of Fig. 1 into three equal spaces as shown by d and h.

Erect vertical lines from d and h until they meet the line U-13. This gives the mitre line where the prongs join the large pipe.

Now draw full or solid lines from each of the points on the mitre line to the points 1-2-3, etc., of Fig. 5.

Then draw dotted lines as shown.

Then draw the base line W-X, Fig. 6, and at X erect a perpendicular line X-Q on which from X lay off the distances that each of the points a-b-c-d, etc., of Fig. 5, are above the corresponding numbers 1-2-3-4, etc., of the line 1-7.

Now from X on the line X-W lay off spaces equal to each of the solid lines on the elevation. For instance set the dividers to the space X-1 of the elevation and transfer the space to the line X-W as shown by X-X.

Then the dividers must be set to the space 9-2 of the elevation and transfer to the line X-W as shown by X-S.

Transfer each of the other spaces until all the full or solid lines are transferred.

Now from each of these points erect a perpendicular line equal to the distance from the line O-P, Fig. 1, to the edge of the plan of profile as shown by the line O-a-b-c-d-h-P, Fig. 1.

For instance erect a perpendicular line from 10, Fig. 6, and make its height equal to 10-C, of Fig. 1, as shown by 10-10' and as the line 10 of the elevation runs to point at the end in a like

manner, draw a full line from 10' Fig. 6 to point 4. This gives the true length of the line 1-4 of the elevation.

In a like manner find the true length of each of the other full lines.

Next develop the diagram of dotted lines in the same manner as the full lines.

The pattern is now developed the same as previous examples, the measurements for the small end being taken from a to g of the profile, Fig. 5, and for the large end from U to X, Fig. 4, for the mitre end to join the other prongs.

Then take measurements from C to P, Fig. 1, for the prong to join the large pipe.

Draw the line X-X of Fig. 8, representing the line X-1 of the elevation.

Set the compass to a-b of Fig. 5 and with X¹ as centre describe a small arc.

Then set the compass to the dotted line X-2, of Fig. 7, and with X as centre cut the arc drawn for X¹ locating the point 2 or b.

Then with the solid, line 2-8, of Fig. 6, and 2-Fig. 8, as centre swing an arc near X.

Then with U-C, Fig. 4, as radius and X Fig. 8, as centre cut the arc swung from 2 thus locating the point 8 of the pattern.

Continue this until the pattern is developed.

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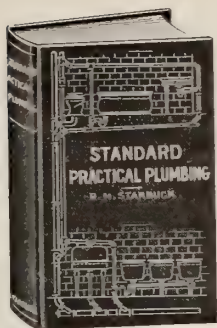
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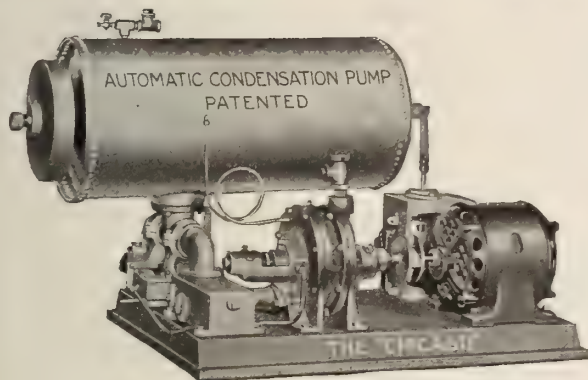
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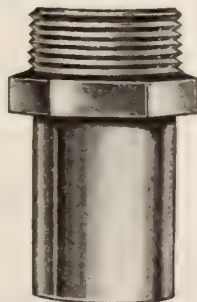
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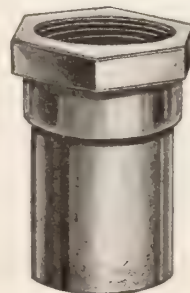
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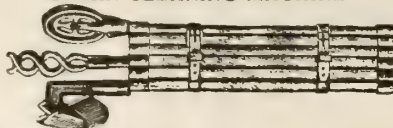
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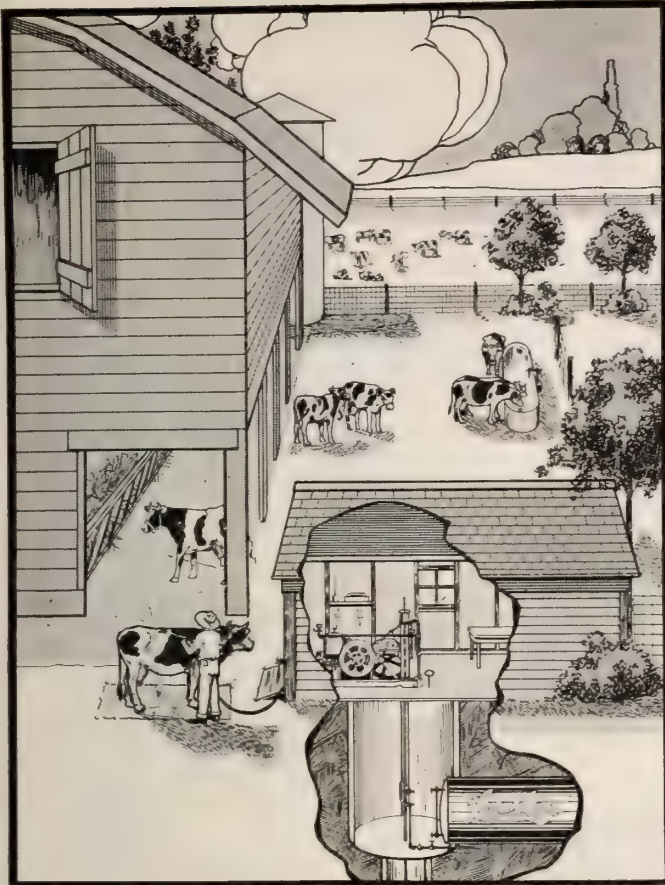
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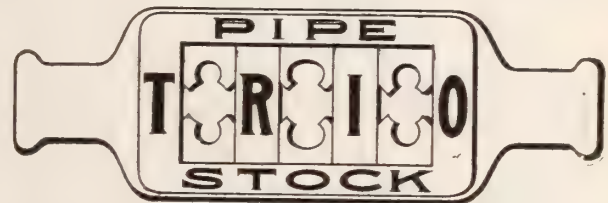
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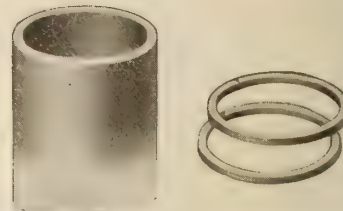
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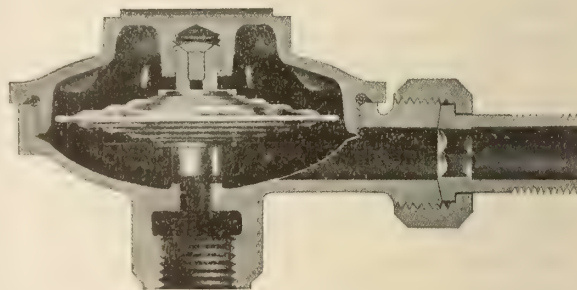
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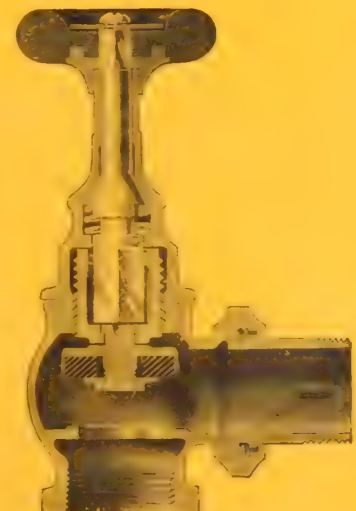
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Give this valve a trial on the next vacuum job or high class steam heating
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'Rapido' Bath, Basin and Sink Cocks,
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PLUMBER & STEAM FITTER of CANADA

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Vol. VII.

Publication Office : TORONTO, OCTOBER 1, 1913

No. 19



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PLATE F370.

PORCELAIN Enameled Flat Rim Laundry Tray and Sink Combination, with one-piece separate back on painted pedestal and sink bracket, strainer, waste plug and rubber stopper, Fuller bibbs and 1½" "P" Traps.

Size of Sink	18"x30"
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F370, less bibbs and trap	27.75
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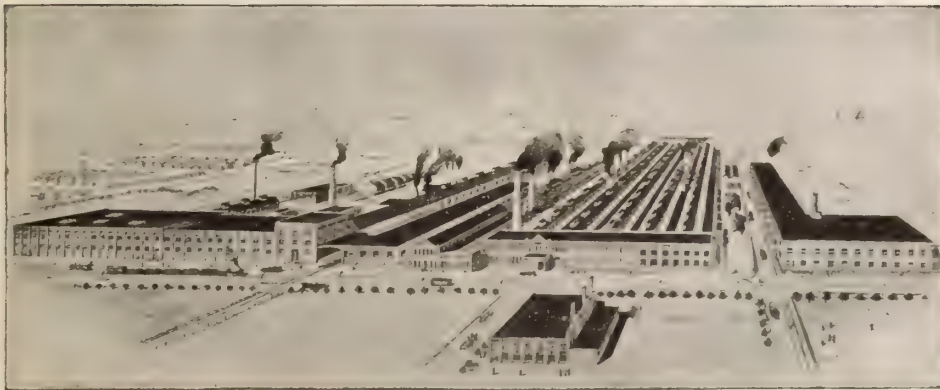
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This bathroom illustrates a simple, but extremely practical and beautiful interior and shows how successfully beauty and utility can be combined. The simple shower over the tiled-in bath offers the maximum of bathing facilities with the least possible equipment and display.

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All Closets of this type, operating on direct pressure, should be supplied with water at a minimum pressure of ten pounds through a full 1¼-inch I.P. size supply pipe to each Closet.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

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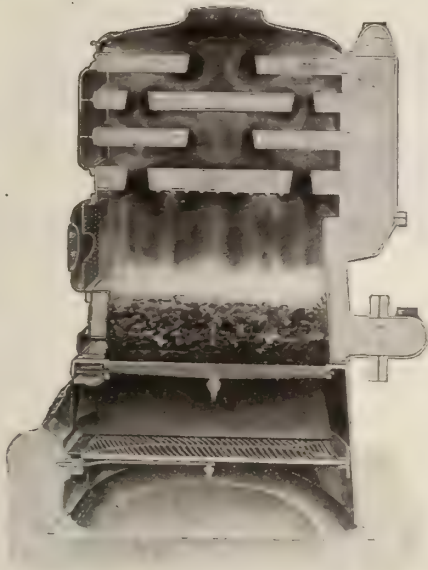
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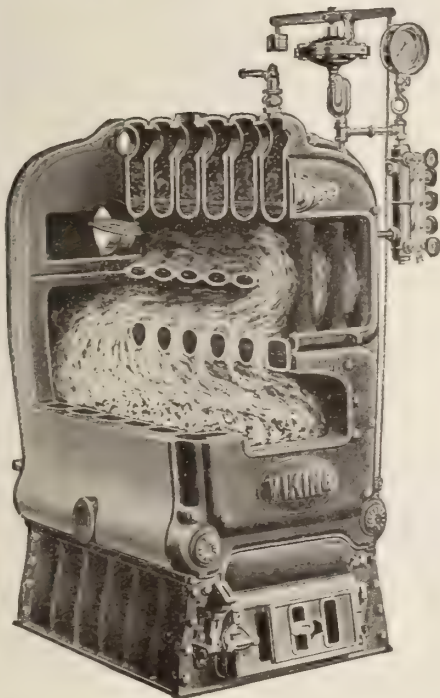


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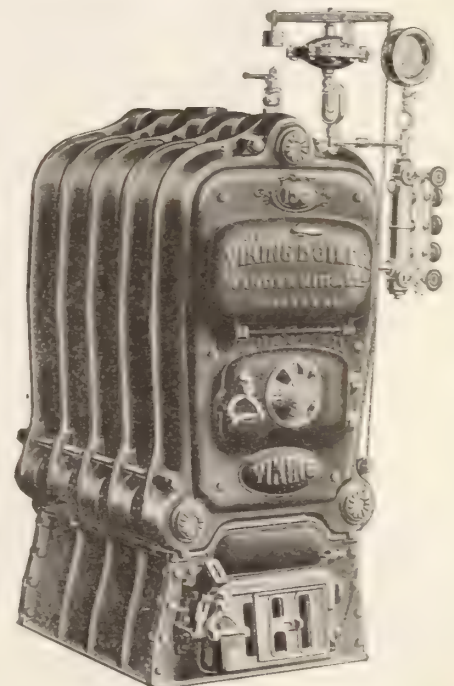


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They are easily regulated
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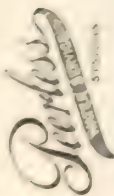

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"I do not know much about the science of political economy, but I do know this—that when we buy goods made in a foreign country, we get the goods, and the foreigner gets the money; but when we buy goods made at home, we get both the goods and the money."

Abraham Lincoln

National Equipment Company, Limited
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A complete variety of boilers and radiators for every possible purpose — that's the Gurney-Oxford Line.

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Radiators of every size and style for every requirement.

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And *Service* is our keynote. We have increased our West Toronto plant so it is possible for us to give you prompt deliveries on any of our lines. No matter in what part of the country you are our Branch House with a complete stock is near you to give you Service on your every requirement.

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This great, and constantly increasing demand proves better than anything else the merits of the only absolutely safe and dependable seal for hot water heating systems—the Honeywell Heat Generator. You should know all about it and how it is used in connection with the Honeywell method of piping.

If you haven't a copy of our fitter's handbook, write for one. It tells all about Honeywell Hot Water Heating.

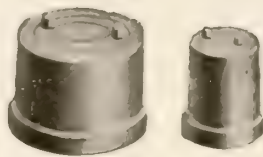
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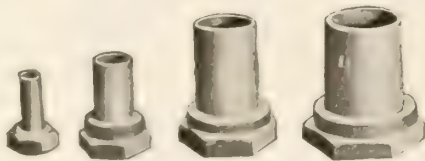
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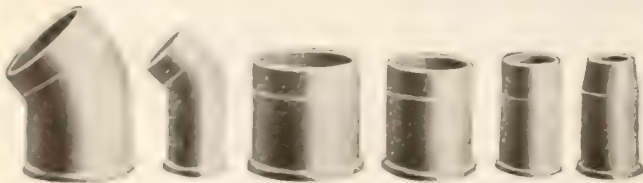
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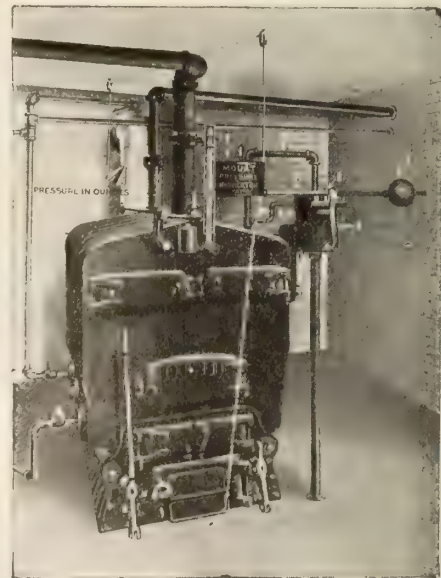
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THE MOUAT VAPOR HEATING SYSTEM

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

The Mouat-Squires Company, Cleveland, Ohio

**I'M
NYE
the
Die
Man**



In Threading Steel or Iron Pipe

The threads should be nearly enough perfect to FIT. That is, the fitting and the thread should touch, metal to metal, with no ragged edges.

**If They Don't, They Are Not Cut
With a NYE Die!**

The Nye Die is so constructed that it cuts a thread smoothly, well trimmed, clean and regular. The skip-tooth method that has made the Nye Die World Famed, permits the die to work without tearing. The result is a clean thread, a thread that delights the workman, and a thread that didn't demand that he pull his arm off to make. And a thread made this way makes a strong joint, a tight joint and a joint that defies all the little troubles of leakage and deterioration, so well known to plumbers and steamfitters.

Don't depend on dope to make tight joints. Use a Nye Die and get an absolutely tight joint at the right time—the time you do the job.



THE NYE TOOL AND MACHINE WORKS

124 N. JEFFERSON ST.

CHICAGO, ILLINOIS

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



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with considerable capital and own warehouses wanted in important places by first-class German Special-Factory for new patented regulating-cocks (valves for steam and hotwater-heating arrangements). Only experienced men with old and good clientele will be considered. Detailed offers, with references, to be sent to

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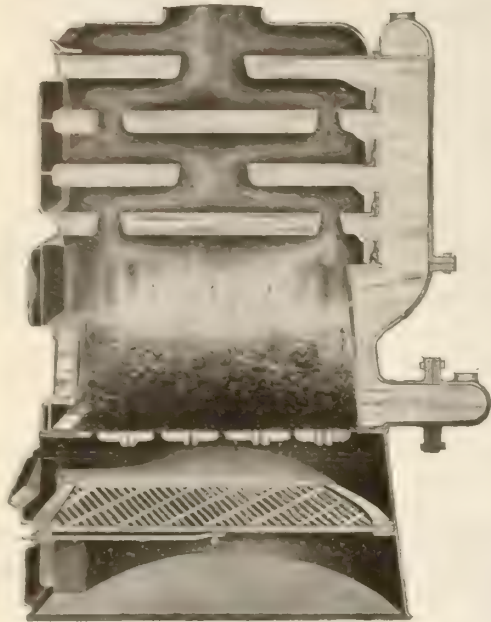
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STEEL AND RADIATION, LIMITED



Cross Section, No. 5 "King,"
showing Corrugated Fire Pot, Tapered
Smoke Passages, Big Mouths into Water
Post, Scientific Arrangement of Heat-
ing Surfaces.



"King" One-Piece Ash Pit

You don't have to draw on your imagination—

To sell a man a "KING" Boiler.

Simply point out its many advantages, and he will be convinced.

From Ashpit to Smoke Pipe its "improved," "up to the minute," and just a lap or two on every point ahead of any competitor.

Show your prospect the "**Patented**" Trouble-Proof Grates of the "King" Boiler, connected without split-pins or bolts.

Let him try the "side lever shaker" and demonstrate to himself how much easier and simpler it is to operate than the old-fashioned, back-breaking "crank."

Tell him about the "double in size" **mouths on the water post** and their importance in quickening circulation.

Explain to him the "**Corrugated**" **Firepot**, which **increases** its Heating Capacity one-third, also the large combustion spaces between sections, which allows the gases to burn before going to the smoke pipe.

These and the other manifold features of the "**King**" Boiler are ones that make an impression on a man. A half-hour's talk on straight common-sense advantages like these will influence your prospect more than all the "oldest firm" and "longest record" pleas the other fellow can think up in a week.

King Boilers are making records and reputations for themselves and those who install them.

"**King**" and "**Imperial**" Radiators are so well and favorably known that it is only necessary to mention them.

We guarantee prompt delivery.

We carry a full and complete line of Steamfitters' and Engineers' supplies.

Did you get one of our "**New Fitters' Hand Books?**" If not, ask for one. In it we illustrate and list our complete line of "**King**" and "**Royal**" Boilers and "**King**" and "**Imperial**" Radiators," also other valuable information.

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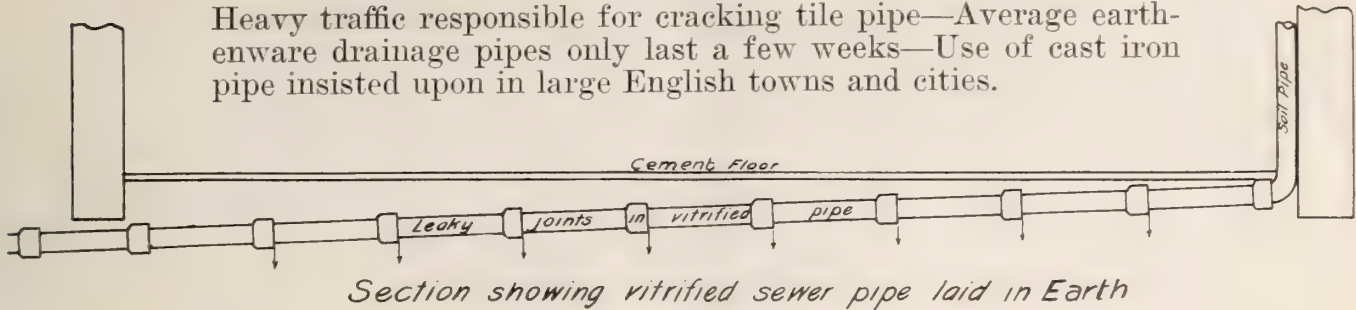
Showrooms:

80 Adelaide Street East,
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Agencies in all the leading Cities in Canada

Tile Drain Pipe Cracked by Vibration

Heavy traffic responsible for cracking tile pipe—Average earthenware drainage pipes only last a few weeks—Use of cast iron pipe insisted upon in large English towns and cities.



"The heavy motor-'bus traffic near St. Paul's, London, England, has shaken and cracked the columns of the cathedral so seriously that the Government is considering how the vibration can be lessened.

"All large cities, however, are in a constant state of vibration. In places like London, Manchester, and Birmingham there is not a square inch of soil that is perfectly still. In some large towns it has been found necessary to insist on iron drainage pipes being used instead of earthenware ones. Though embedded in concrete, the average earthenware drainage pipe lasts only a few weeks uncracked.

"Last autumn Professor Ingleton experimented in different parts of London with a seismometer—the instrument used for measuring earthquakes. He found that though the trembling of the earth was naturally less in the suburbs than in the city, and between 1 a.m. and 6 a.m. than at other parts of the day, the constant vibration was such as to make a seismometer in London useless for its real purpose of registering far-distant earthquake shocks.

"Of recent years there has been some talk of finding a fresh site for Greenwich Observatory, owing to the vibrations set up by the London traffic."

There are several towns and cities in Canada which are at present considering the advisability of either compiling a set of ordinances to govern ordinary engineering or considering several changes which they feel should be made in their present ordinances. It is to be hoped they will be well advised and consult the very best authority on the laws of sanitation. The city of Toronto has made several changes, some of which are very commendable.

The trade at large spent considerable time in the re-construction of these new by-laws, but when it came to get them passed by the council the most important of all was left optional, viz., clause 18 which makes it optional whether tile or iron pipe is used. Just to illustrate and explain the struggle which ended by the "tile interest" winning their end, we are reproducing a circular by

F. R. Maxwell, which was distributed in the interest of better sanitation but was of no avail:

Toronto, Feb., 25th, 1913.

Dear Sir,—

In 1887 a by-law was enacted to regulate the installation of plumbing in the city of Toronto. This by-law has been slightly amended from time to time, notably during the years 1901-2-3-4, but strange to say, the sanitary engineers were not consulted when these amendments were considered and ultimately became law. With the tremendous growth of the city, and the necessary problems of sanitation that are attendant upon such growth, it has been found necessary to amend this by-law so as to meet the requirements demanded by scientific sanitation. To do this, a committee was selected by our medical health officer as follows:—

Dr. Hastings (Chairman); Mr. Burke, architect; Alderman May, City Council; Alderman Yeomans, City Council; Mr. Aldrich Mason, representing Builders' Exchange; R. Cunningham, representing journeymen plumbers; F. Maxwell, representing sanitary engineers; W. Meadows, clerk of committee.

We met for months, and after getting the very latest and up-to-date by-laws from all over Canada, United States and the Mother Country, we arrived at our decision and so amended our present by-law so that we would have a simple, economical and workable by-law along the most sanitary lines possible. This by-law was sent to the Board of Health, and then on to Council, where it received its first and second reading on Feb. 24th, and will come up for its third reading on March 10th. I am given to understand that, now it is before the Council, that some manufacturers (who by the way, have their plants located outside the city of Toronto) claimed that it would ruin their business. Mr. Trowern, on behalf of the Retail Merchants' Association, pointed out that five retail dealers in tile pipe, who carry on business in the city, would lose in their sales if Clause 19 of the new by-law carried; that is, all drains used for sewers or waste water under any build-

ing, except provided for in clause 28 of this by-law, shall be of cast iron and of the kind and weight specified.

The committee listened to them and then asked them to give us some reasons why we should continue to use tile when it was condemned all over the world. They could not give any reason, but promised to do so. They came back in three months' time with the same old story, "You will ruin us." The committee pointed out to them that they were appointed to draft the best sanitary by-law that the Queen City of Canada should have, irrespective of manufacturers or jobbers. Cheap speculative builders claim that the compulsory use of iron pipe will increase the cost of the drains so that it will be a burden on the working man. This enormous cost would amount to about \$12.00 at the outside figure on the ordinary house, so you can see at a glance who would be the winner. The working man would get the benefit, as he would be getting something that was perfect in the place of a substitute at present. Another argument advanced was that considerable acid was used, such as jewellery establishments use, and that corrosion, etc., forms on iron pipe and eats it away. These are isolated cases and our by-law provides for them as special cases. Arguments such as the above are the only kind that they can bring along. With the influence that they can bring to bear on some of our city fathers, who cannot think or act for themselves, but will listen to people who know no more about sanitation than the pipe that they want us to keep on using in face of the information that we have before us. I will mention a few of the cities that have been using iron pipe for drains and found them very satisfactory, viz:—

New York, 25 years; Baltimore, 29 years; St. Louis, 27 years; Buffalo, 17 years; Philadelphia, 24 years; Detroit, 30 years; Washington, 25 years; Toronto, 25 years; Winnipeg, Montreal, West Toronto and many others.

The State of Ohio have passed a State by-law prohibiting any pipe but cast iron being used under any building. In the city of Toronto all our public

schools, municipal and county buildings, large office buildings, banks and most of the best residences have iron pipe drains. Such men as Alderman Rawlinson and Alderman Weston put iron drains even in stables. Surely these men would not put in material that would deteriorate when it is optional which they use. "The best is none too good" is their motto, where sewerage is to be taken care of.

Now let me itemize the arguments against tile.

1. It being made of clay baked, it is easily broken.

2. Tile pipe being only two feet long, there are three times the number of joints to make tight, if possible.

3. The joints being made of cement will not give one-hundredth part of an inch without leaking.

4. Shrinkage in building material will cause connection between iron and tile to break.

5. The smallest settlement around pipe or filling and packing earth in trench will cause the joints to leak, no matter how careful you are.

6. Pipes being laid just under cement floor, pounding on same, chopping wood, etc., will make joints leak.

7. Clean-out screws cannot be placed in tile, as if you had to take them out, your joints will leak and cannot be repaired again properly.

8. Cement not properly prepared will blow off joints, and has been known to break hubs clean off.

9. Stoppage can be attempted to be cleared by anyone who can use a pick and shovel. The result is a hole, or several of them, are made in the pipe and then a piece of tin, slate or any old thing with a patch of cement to keep the earth from falling in. Anyone knows that tile tin and cement will not set together; your drain is forever destroyed and useless as a preventive against sewer gas escaping.

Arguments in favor of iron:—

1. It being made of iron moulded, is not easily broken.

2. Iron pipe being made in 5-ft. lengths, has one-third less joints to make

3. Joints being made of lead caulked are more flexible and will stand any amount of jarring, settlement of earth, vibration, etc., and will remain absolutely tight.

4. Drain can be laid on wall, floors or any old place with no danger of its being damaged or impaired.

5. Clean-out screws can be placed anywhere you like and still be used without any damage to drain as it is iron all through.

6. Stoppage can be repaired only by a skilled mechanic, and therefore

your drain will always be as good even after stoppage is repaired.

I do not think that I need go any further into this matter, only to let you know that when the present by-law was made up over 25 years ago the committee who prepared same were afraid of tile even then, as in clause 5, page 5, it states that where a continuous iron drain is used, you can dispense with the main trap and fresh air inlet. On the other hand, in clause 1, page 1, you must put main trap and fresh air inlet when using tile pipe, so you see that they gave the iron drain the credit for being more durable and less liable to leak. We have also in every house where drains are used at the foot of stack, three to five feet of iron under ground. Why was this provided for in clause 17, section 3, page 9? Simply because the tile drain could not stand the down rush of water from the various fixtures.

In conclusion, I would ask you to try to show anyone whom you might think interested in having the best, most economical and most sanitary by-law that the citizens of Toronto are entitled to.

Yours very truly,

F. R. MAXWELL.

There is not the slightest doubt but that sanitation is becoming the barometer of progress, the more we retard its progress the more will other lines of progress be retarded.

Sanitation to-day is coming more to the front than ever and it will certainly be bad policy to allow anything to stand in the way of its progress.

Sanitary Engineer is informed from several cities that their by-laws governing the installation of sanitary and domestic engineering are to be revised. Hence this paper is taking up the question of which is the best material to use especially within the area of our homes. No city, which is building for the future, and where the health of its citizens is held of importance, can afford to be sentimental in matters of sanitation and when compiling by-laws should have the very best advice possible. No "interests" should be allowed to voice their position, as all such opinions cannot help but be biased.

Much has been said in favor of tile pipe by drain-diggers, tile and pipe manufacturers, etc., and all kinds of biased arguments have been put forth. They have claimed long life for tile pipe, etc., and stated that iron pipe would soon rust away.

Now why do all cities and towns use cast iron pipe for water supplies and mains? It seems to be lasting alright. There is a greater strain on water piping. It even holds tight and has done so for a considerable period, although as much as 100 lbs. per square inch is

maintained in some cities. There are methods of treating iron to prevent rusting, but no amount of treating would make tile pipe as serviceable under the same conditions. We are reprinting a small article that appeared in an English journal two weeks ago, which shows another reason why cast iron soil pipe is felt to be more desirable than tile pipe. Even though the tile pipe was bedded firmly in cement it has been found to crack with the vibration in a few weeks' time.



SANITATION TO BE DISCUSSED.

The first annual meeting of the Sanitary Inspectors' Association of Western Canada will be held at the Parliament Buildings on Friday afternoon at 2 p.m.

The main business of this session will be the completion of the work of organization, the election of the officers of the Association for the coming year, and the adoption of a set of by-laws, of which a draft has already been made. Other matters of importance to the Association will also be taken up.

The present officers of the society will be present at the meeting. They are as follows: E. W. J. Hagne, president, Winnipeg; Alexander Officer, Winnipeg, secretary; P. B. Trustman, Winnipeg, vice-president of Manitoba Association; Thomas Watson, Regina, vice-president Saskatchewan Association.

At the present time the head office of the Association is at Winnipeg, but it is hoped that with the Association fully established throughout the West it will be possible for each provincial branch to hold its own meetings.

In addition to attending their own convention the visiting delegates of this department of inspection will take part in the Public Health Congress. The visiting delegates will be entertained at luncheon on Friday at the Parliament buildings by the local members of the Association.



HAMILTON SEWAGE DISPOSAL PLANT NEARING COMPLETION.

Work on the new west end sewage disposal plant is progressing well, the work of putting in the concrete being now under way, City Engineer Macallum is still sanguine of completing this work for considerably less than the \$60,000 his tender amounted to. When the three tenders were opened the city engineer's was found to be over \$40,000 less than the next highest and \$100,000 less than the third tender. Needless to say there was no hesitation in giving him the contract. It is expected that the new disposal works will be in operation before the snow flies.

Words of Wisdom to the Sanitary and Heating Engineer

Article by Jno. E. Godwin, Secretary of the Nova Scotia Association on Co-operation.

The contented man is he who lives at peace with his neighbors. The successful man is he who makes the best use of his neighbors.

The successful sanitary engineer needs all the help he can get from everybody who will help him, and his business neighbors ought to be given every opportunity to do their share.

There are plenty of days when you have time to spare, time to get out and see what kind of men the other fellows in business in your section are. Take advantage of such opportunities. If you don't like to go and visit your com-

tied the remaining sticks into a large bundle and told the sons to break it. They could not do so, either individually or collectively. This fable illustrates the value of co-operation. Any single small operator is no match for the strength of big competition; but let a dozen or fifty, or even three master sanitary engineers combine their strength and set out to hold the business that is justly theirs, and the bigger man will find he has struck a snag when he tries to take it from them.

All advice is good if carefully considered, for whether good or bad it serves its purpose if it makes us think. Thought will soon bring each of us to the correct solution of his individual problem. It is for that reason these articles are written, and also because I maintain that every success has behind it an imitable cause. Accordingly, I have outlined the causes behind making the plumbing business a success.

Of course the principles I have enunciated are only of value to you in proportion to your efforts in building for the future, and without such efforts you do not need an influx of modern merchandizing principles into your business.

Now, probably some of the trade will read this and say: "Well, that sounds good and it seems sensible," but that settles it as far as trying to help the cause along goes: they don't even send in their first year's dues to their local association.

The man who joins business associations only for the good they will do him is a form of a sponge. Don't stop with getting all the good you can. Do all the good you can.

JOHN E. GODWIN, Halifax.

TRADE NOTES.

E. R. Mann, general sales manager of the H. Mueller Manufacturing Co., Decatur, Ill., spent a week recently in Chicago, after visiting the company's new Canadian plant at Sarnia on business and the Lakes on pleasure. Mr. Mann reports general sales excellent and prospects for fall most encouraging.

The plumbing firm of Armstrong & Weller, New Brunswick, N.J., has dissolved partnership. Mr. Armstrong will continue the business at the same address.

Theodore Ahrens, president, and Charles A. Carothers, general manager of the northern offices of the Standard Sanitary Manufacturing Co., are at present in Europe on a combination of pleasure and business.

In our last issue we reproduced a letter in fac-simile written by J. E. Godwin, secretary of the Nova Scotia Association. This week we have pleasure in producing a photograph of this progressive craftsman. Mr. Godwin is a hustler; his mind is ever alert for good points which will be a benefit to the craft. He was a 'live-wire' at the National Convention held in June last, as will be seen by those who read over the convention reports. We know there are others equally as 'live,' but they do not care to be brought into the limelight. Why should this be? If you have a good thought why hide it? Such a course reminds us of a story told in an advertisement which appeared in Sanitary Engineer some time ago where a man invented a wonderful incandescent lamp; found he had the best in the world, and said to himself: "I've got all other lights skinned to a frazzle. Everybody will have to come to me for these lights." So he put his light into a hole and crawled into the hole, then pulled the hole in after him. It is just the way with those who are in the trade, and know a few good things which would benefit the trade as a whole, but won't speak out for fear of a little publicity.

NEW BOOKLETS.

Messrs. Warden King, Ltd., are issuing a very useful book of data on steam and hot-water heating. Its contents are very neatly gotten up, and are of a very valuable nature. They have certainly embodied all the heating engineer could desire in the way of useful information. These books can be had free by writing Messrs. Warden King, Lombard Street, Toronto.

Steel and Radiation Ltd., Toronto, have recently issued a new and very valuable handbook. Every heating engineer should own one of these books, which are neatly bound in black cloth and gold. They are a handy pocket size, and contain a volume of information. Those who wish to possess one of these books may do so by writing Steel and Radiation, Ltd., Fraser Avenue, Toronto.



JNO. E. GODWIN.

petitor's store ask him to come and visit yours.

Co-operation among business men is the keynote to some of the big successes of the future. Instead of a few monopolistic successes we will have closely knit associations of the smaller shops, buying together and working together for our mutual advantage.

Such organizations are already making good in some lines, and are proving themselves to be serious factors, with the ability to secure special terms from manufacturers and to uphold prices in the face of the cut-rate tendencies of price slashing competitors.

You remember the old fable of the man, the sons and the bundle of fagots? Each son was handed a single fagot which he broke readily; then the father

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorrimer, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health, Architects, etc.

TORONTO, OCTOBER 1, 1913

CO-OPERATION AND PRICE CUTTING.

Never was there a time when each and every one in the craft felt the need for co-operation more than at present. Then in that case put aside petty ill feeling—manfully forget the past. Join the association for your own benefit as well as for the trade as a whole. Let the past be for ever blotted out, the stings of the past are only the wages of past conduct as a whole. We have lived the past, but have still to live the future. Look upon the future as the solution to past troubles. Make up your mind to be at the first meeting of the association and remember to be on your good behavior. Don't go to create trouble, but rather to help overcome it. All have transgressed more or less in price cutting and other shady methods "to secure the job" and all have suffered in consequence.

So forget the past, let the wound heal up in your own heart and you will find the other fellow is trying to do the same. Remember what you have come to the meeting for. You are there to try and better conditions for the trade as a whole. By choice, you are a member of one body, viz., the sanitary engineering body. If one member of that body is hurt, the whole body will feel the sting. If one member transgresses, it will hurt that member the most, even though the whole body will feel it. Just try and think that the craft is one piece of physical anatomy and portrays what we are like.

Here is the picture. We have passed through trials and adversity. We are a dismembered body. Just imagine a man's body having become severed into different portions. Place all these portions together. Inject all the healing properties into the body. Stitch the limbs together. Avoid any friction by putting them into splints, thus allowing the healing properties to act spontaneously. Take your medicine like men. Don't avoid the meetings of the association for fear of some one calling you a liar, because "All Men are Liars," sanitary and heating engineers not excepted. The other day a man in this business said to me: "The man who says he does not cut prices is a liar both to his fellow craftsmen and himself. I cut because I hear the other fellow cuts, and he does it because he hears of me doing it and so on."

Now a lot of this price cutting is caused by statements made by the public and the contractor. The writer could cite scores of instances where a person wanting a job done has got several prices from different men in the trade and has actually gone to each of the men or firms who have sent in their tenders and said he had got lower prices from a competitor when such has

not been the case, simply with a view to lower the price. These figures have been peddled all round the city, and the results have been that the person has been able to find some **poor fool** to take the bait. This is done every day. The public know that sanitary engineers hate each other like poison and can just use that hate as a bait to cut prices. So the best thing that can be done is to let by-gones be by-gones. Be big-hearted one with another. Don't distrust each other in the future as you have done in the past. Stick to your price. Don't use crafty methods to get even with the public. Be just to yourselves as well as the public—find out by hook or crook what your overhead expenses are. Go to an accountant and find out how your business should be conducted to put it on a paying basis. Then stick to your overhead charges when sending in a tender—or making up an account. It is no affair of yours what your competitors overhead expenses are, but of course it behooves you to keep down these expenses.



SANITARY ENGINEERS AND GARBAGE COLLECTION.

Up until recently sanitary engineers have been called plumbers. Of course we are all aware of the reason why the title 'plumbers' seemed to be held by those in the trade, but time brings changes, and these changes must, of necessity, be either progressive or non-progressive.

The progressive one-time plumber will naturally evolve into a sanitary engineer. This change is not only in title but in actual practice. He must not only be a **worker in lead**, but must have a more thorough knowledge of sanitation than the original plumber had. This craftsman must keep a little ahead of the times. His work is for the future more than any other line of calling. If any defects or poor mode of construction are followed out, the whole human race will suffer for it. The more efficient the work of our present sanitary engineers, the better will be the future. Our laws of sanitation must be modelled for the future more than any other line because so much depends upon them. The present as well as the future sanitary engineer should be a craftsman who can give the public the best methods of water supply and filtration. He should be the one who can plan the proper conveying and final disposal of the domestic as well as industrial sewage.

Up to the present we have no real disposal systems to speak of, particularly in the young new countries. Even until recently some of the older countries had not really been disposing of their sewage, but rather replacing it.

In this country we have been content to pollute our streams and waterways until we are finding out that this method must be discontinued. We, in this beautiful country have the largest number of cases of typhoid; which is nothing more than a filthy, preventable disease—a disease which saps the vitality of the victim even if he or she recovers. Then we have that most dreaded of plagues, tuberculosis, another preventable disease, both of which are problems for the sanitary engineer to solve along with the aid of the medical faculty.

This is a very wide statement to make, but it is none the less true. Tuberculosis, if cured at all, is always by the patient living outside in the open air and if we look into the matter we will find that those cases, which have been fatal, have come from homes where the ventilation of the home has been most disregarded.

We have no laws for the ventilating or heating of our homes. Hence the large number of cases of tuberculosis.

We have laws to govern the food we eat and the beverages we drink. We have laws to prevent the pollution of our lakes and streams, but these latter are not carried out to any great extent. Yet we have no laws governing the proper ventilating of our homes.

This is a matter for our sanitary engineer to voice if they are to evolve or, shall we say, become thorough sanitary engineers.

The heating, too, of our homes is another phase of sanitary engineering. The method adopted of installing hot air furnaces is anything but sanitary, hence proving that the heating should be under the control or jurisdiction of our boards of health, both provincial and municipal. In fact, there should be a general federal law governing all these matters which the provincial as well as municipal should be governed by, these latter to have certain clauses to suit the different climatic conditions which prevail in a country with such a wide area as Canada.

We have shown our readers that the sanitary engineer should be a man well versed in the laws of water supply, sewage disposal, heating and ventilating, the latter with a view of keeping pure the air we breathe.

We have yet another problem which is for the sanitary engineer to solve and that is the collection and disposal of our garbage. It should be collected in a sanitary manner, conveyed to the disposal plant in a sanitary manner, and finally disposed of in a sanitary way, which should be final.

The method of dumping it into one place is by no means a sanitary way of disposing of this garbage; neither is it an economic way. This garbage has a value, and, if properly handled, should and will take care of its own cost of collection and final disposal. We will go into that phase of the subject later on.

As regards the collection of our garbage, it should be done in a sanitary way so as not to have the atmosphere of our streets, avenues and boulevards polluted. In large cities there are certain days when the garbage man comes round and what do we find? Boxes, cans, barrels, paper parcels, and bags of garbage and in many cases large piles of rotten putrid garbage, lying on our lawns and in our streets for hours, at once polluting the atmosphere, contaminating the soil, and our pavements to no small degree.

On a windy day the paper blows about and becomes a perfect nuisance. A few days ago the writer saw a spirited horse frightened, which caused a runaway. This alone may have proved fatal had some one been in the way.

The sanitary engineer has evolved several kinds of fixtures of a sanitary nature to receive sewage as a means to convey matter through drains and soil pipe to our sewers. Why not evolve a system of garbage collection and receptacles suitable to receive in a sanitary manner so as to be able to collect and finally dispose in a sanitary way and thus prevent the polluting of the atmosphere as well as the earth on our lawns? The method of emptying the cans, barrels, etc., into carts is altogether wrong, as these carts are really a means whereby our streets are further polluted by the moisture leaking out of the carts and practically sprinkling putrid liquid along the streets in no small way. In another article in this issue we have a suggestion as to how this question could be handled in a sanitary manner, at least.



EDITORIAL COMMENTS.

Charge for your advice.

• • •

Make a charge for estimating.

• • •

No advice should be given free.

• • •

It has cost years to acquire the knowledge. Why hand it out free?

• • •

One must be just to be generous.

• • •

Sanitary Engineers as a whole are the most unjust class of people on this crust (to themselves.)

• • •

Honesty is the best policy. No class of men are so dishonest (to themselves) as Sanitary and Heating Engineers.

• • •

We all read something sometimes if we can read, but how many read their trade paper regularly?

• • •

A man should always read his trade paper. It is published in his interest. The articles always bear on topics of interest to his particular line of business.

• • •

Jones:—"Say Brown, what's the difference between a glass of water and a car fare?"

Brown:—"Can't say Jones. What is it?"

Jones:—"Five cents."

• • •

HERE'S A BETTER ONE.

Brown:—"What's the difference between the advice of a Doctor and the advice of a Sanitary Engineer?"

Jones:—"Can't guess that one."

Brown:—"Two dollars at least."

Yes and remember, when you ask the advice of a Doctor about your internal or external physical trouble, he advises you to take a certain kind of dope, etc., and do so and so. He will **not guarantee** a sure cure of your ills. But on the other hand the sanitary engineer gives you advice **free** will **do** the job and guarantee you a cure.

• • •

The value of the craft can only be rated according to the proportion of unity in our ranks. Then unite. To be united is to have strength, for unity is strength. Strength is power. Power is valuable power costs. To attain power in one's-self one must gather up all loose ends of our thoughts, words and deeds. Prepare these loose ends with the flux of brotherhood so as to be ready to join others in our ranks in making a united whole.

Make Your Customers Your Friends

A Story With a Moral

Showing how essential it is that sanitary and heating engineers should be more friendly with their customers, and in a way treat the public as a whole in a similar manner as the medical man would his patient.

Times were busy. Angus Ray of Ray Brown & Co., was deeply engrossed in a set of plans which had come in the day before, from one of the leading architects of the city. He was to have a tender sent in for the sanitary heating as well as the ventilating of a new residence.

The firm of Messrs. Ray, Brown & Co. had only been in business about three years, but by hard practical work and giving good value as well as satisfaction to the public, were gradually coming to the front. This was the first set of plans received from this noted architect and Angus Ray felt it quite an honor to be asked to send in a tender. The fact of the matter was that the architect had a certain number of sanitary engineers on his list who did all the work brought under his care and was getting fairly good satisfaction, so did not feel it necessary to add the firm of Ray, Brown & Co., to his list. But the owner of the new residence had voiced his desire to have a figure from them. So the architect could follow no other course but ask for their tender. Now this tender had to be received by the architect on Thursday at noon, and this was Tuesday, 10 a.m.

As we said before, Angus was busy at the plans mentioned and had become very much engrossed, when the telephone bell rang. He reached and took the telephone up.

"Yes, this is Mr. Ray speaking." It was Mrs. Branthet, and her house was at the other end of the city. The range boiler had burst. The water was flooding the kitchen which had a hardwood floor, and Mrs. Branthet wanted a man at once. She had heard the firm of Ray, Brown & Co., did good work and would they send a man up at once.

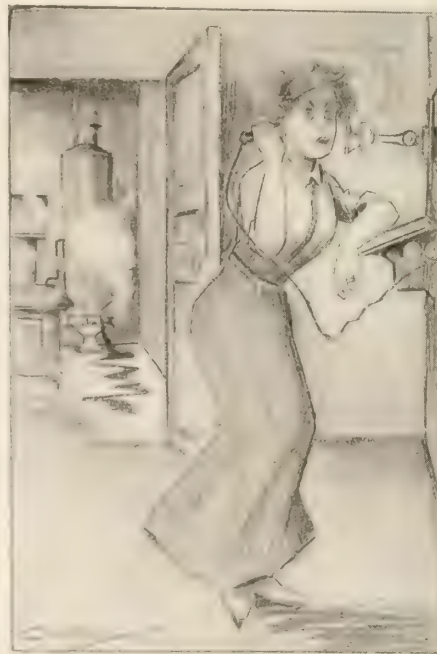
Angus Ray's mind, being full of the plans, at once reverted to their three men all of whom were out and would be for the rest of the day.

He replied that he was too busy himself and their men were out and would be all day. He said she would have to try some one else.

She still persisted and said: "Can't you get hold of one of your men and send him? My kitchen is flooded. We have a washing on. My wash woman only has Tuesday to spare me, surely you can help me out."

But still Angus remained firm and told her he couldn't help that, he had his work set here in the office and repeated that all their men were out too, etc.

So Mrs. Branthet put up the receiver. She felt about as disgusted as it was possible to feel. Here she had had this firm in her mind for some time, and had decided to give them the first work which came in her way. She had even voiced her opinion to several others in



a kindly manner, which had resulted in quite a few of her friends sending work to Ray, Brown & Co. Then when the opportunity had come round she had to get someone else. It was aggravating she would never say another word about them, no she wouldn't. She had to phone up several firms.

However, she got a man who had a small workshop a few blocks away. This fellow came along and fixed matters up by using a plug and thus allowing the washwoman to finish her day's work. The man advised Mrs. Branthet to have a new boiler installed and told her how that, when a boiler began to leak in that way, it was liable to do the same again almost any minute, which resulted in him getting the order for a new boiler.

Well, time went on. The firm of Ray, Brown & Co., sent in their tender.

The architect as well as the owner were very much impressed by the figures they received and were giving the matter their serious consideration.

That evening Mrs. Branthet was paying a visit to Mrs. Williams, whose husband, by the way was the gentleman asking tenders through his architect, who had requested one from Ray, Brown & Co. During the evening Mrs. Branthet told of her trouble with the range boiler and told how she had been treated by the firm of Ray, Brown & Co. "Mr. Ray seemed so indifferent. It was none of his business. He couldn't help it and so 'on. Do you know, Mrs. Williams, I was at my wits' end and Mr. Ray never made any suggestion to me and here my kitchen was simply flooding with hot water."

Mrs. Williams said she had experienced similar treatment. "I'll tell you what it is, Mrs. Branthet, those plumbers are a dread. It would be the finest thing in the world if civilization could get along without them. We are building a house very soon and I'm simply dreading the expense, care and worry which I know we will be up against. One thing certain, we are going to spare no expense in procuring the very best." "Well, I'll tell you what I think about it, Mrs. Williams, Mr. Ray has treated me badly and I shall never call on them again whatever happens. But, then, its only typical of them all. As soon as they get on a bit, they simply know we are in their power. Upon my word, its a treat to go out camping for a month or two, where plumbers are not needed. I wish to heaven society would go right in and adopt "the simpler life."

"Well, Mrs. Branthet, I'm so glad you told me of Ray, Brown & Co., because I believe I heard Mr. Williams mention that they were tendering on our new house."

"Do you know I found out later on that one of Ray, Brown's men was working just three doors from my place. What do you think of such treatment?"

Mrs. Williams, of course, felt that Mr. Ray had treated her friend very shabbily. At the breakfast table, next morning, Mrs. Williams related to her husband the trouble Mrs. Branthet had experienced, and mentioned Mr. Ray of Ray, Brown & Co., being so indifferent, etc. She said she wanted him to be

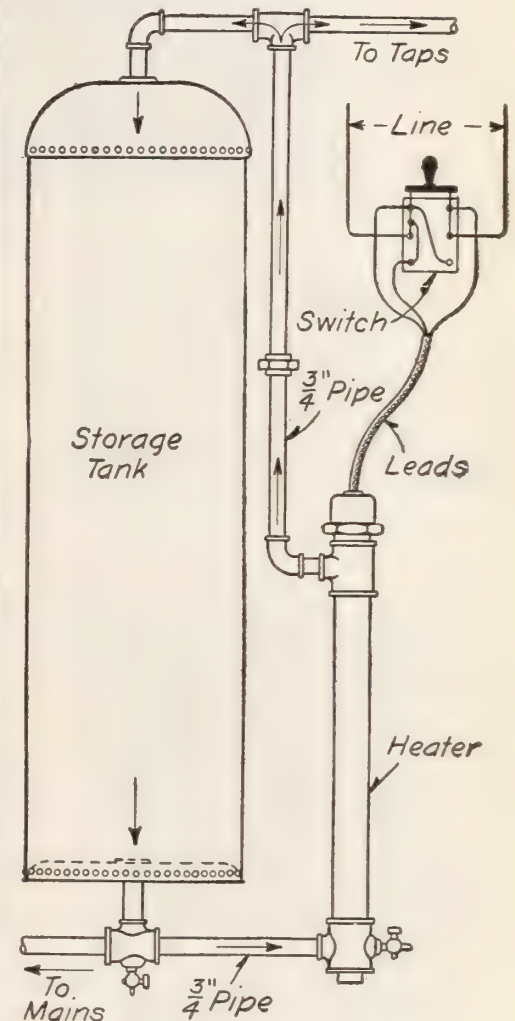
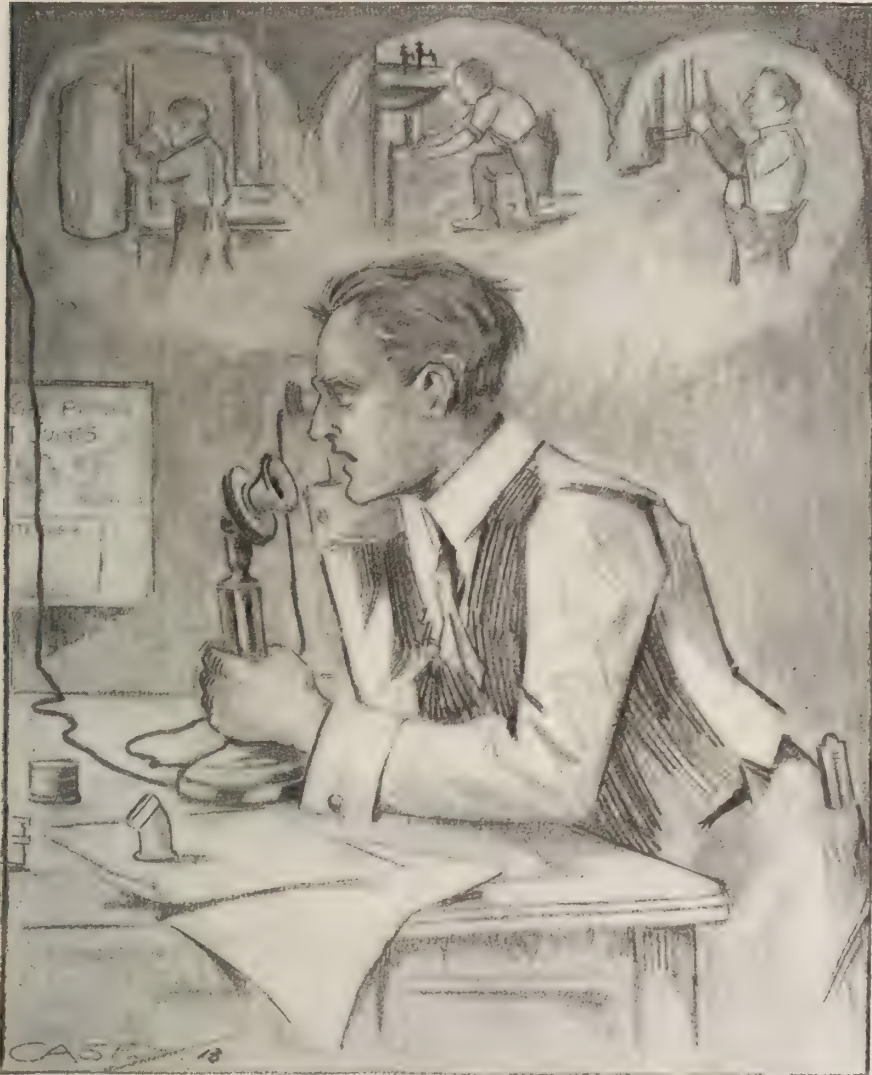
sure and give the sanitary and heating of their new home to a firm who could be got any time, a firm who would tell them how to handle the whole installation and tell them what to do in case of any trouble. This set Mr. Williams thinking, and on his way to the office that morning, he decided to give his work to an old established firm, who, while known to charge the very top price, were also known to be very obliging to their customers.

If he had been a little more interested in the troubles of Mrs. Branthet, and not quite so inconsiderate, the matter would have ended in quite a different way.

No medical man, however busy he might be, would have been so indifferent. It is all a matter of education, of educating oneself to the fact that, when our services are called upon, we are wanted in most cases at once, and there are a

NEW SANITARY AND HEATING GOODS.

The Westinghouse Electric and Mfg. Co., Hamilton, have put on the market a very novel electric heater for range boilers. It is claimed to heat water at about the same cost as gas, where prices are such as is paid in the city of Toronto. It takes up less room, and is very neatly gotten up. The above cut shows the general construction and method of piping same.



This is a true story, and one which is being enacted almost every day in the week. Now why did Angus take such a stand? Why not have given the matter a little thought, and have a ready mind to see and feel the trouble Mrs. B. was in? He had a man just three doors away. Had he just told her to go into Mrs. So and So's, three doors away, etc., what a difference in results. It was so easy and yet caused the loss of a fine contract. Just through a little lack of thought. Even if Angus had told her to see if all the taps were closed above the boiler and explained which tap to open so as to create a vacuum, thus stopping the water from leaking out any further, it would not have been so bad.

thousand and one ways of going into the wants of our customers. We do not instruct them enough as to the management of the domestic engineering, and the public generally have a dread of the necessity of calling in a sanitary or heating engineer. They do not feel the same way when the services of a doctor are required. So what is required from our craftsman is not only good work and practical men, but a friendly attitude toward customers. Become friends with your customers and the feeling which prevails at present between the public at large and the sanitary and heating engineer will take such a turn as will surprise the most severe pessimist.

TO OUR READERS—

We get quite a large number of questions sent in from time to time from our readers who omit to furnish their name and address. In future we must ask that both name and address be furnished, not necessarily for publication, but chiefly to be able to furnish the answer personally as well as through the columns of *Sanitary Engineer*. Often the very nature of the question needs a prompt answer.

Trade Papers and Their Use

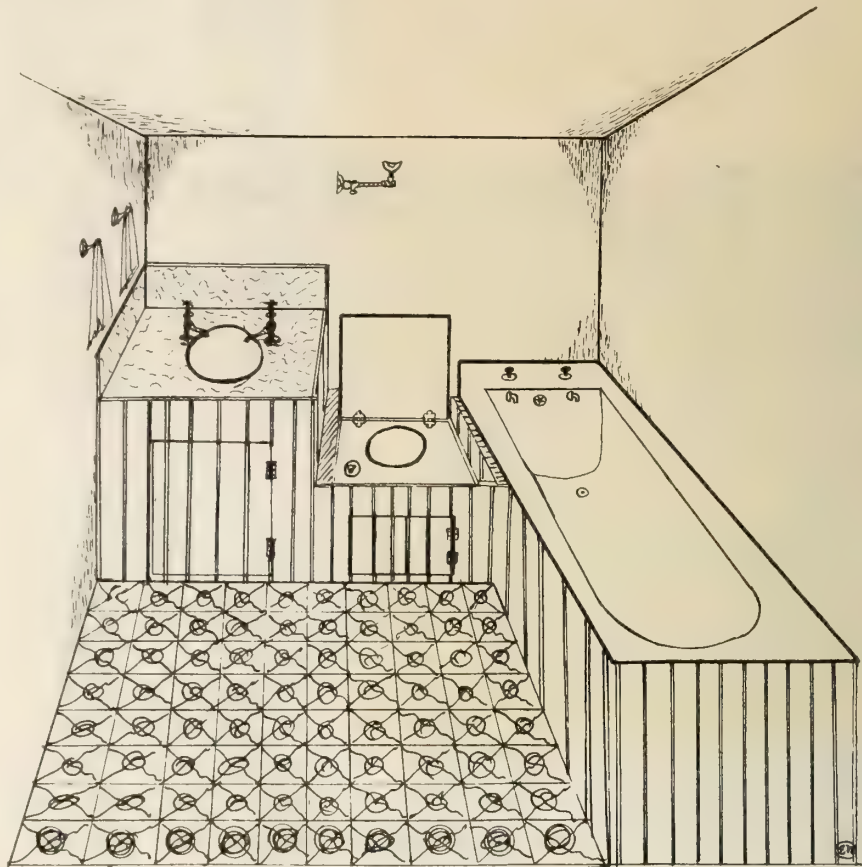
Being a short sketch of what can be learned by reading our trade paper. Its sympathy with the craft, its usefulness if read regularly. How it is made up and why.

Often the writer has been asked what use the TRADE PAPER was to the sanitary and heating engineers. Some have given their opinion that it was of very little use for the simple reason that as a whole those in the trade had so little time to spare to read it. Others have said it was alright from a publisher's point of view. It received good money for advertising, it kept the trade wise as to the new and useful goods which from time to time were put on the market, etc., and various others voiced their opinions in as many ways. None seemed to feel that in actual fact their trade paper was a part and parcel of themselves. If you were to pay a visit to one of the establishments whose owner was a sanitary and heating engineer and asked him how he liked the papers devoted to that particular line, and he said he supposed they were alright but he very seldom had time to read them, you would find he was lacking in some of the finest qualities which go to make up a successful man in every sense of the word. But on the other hand, go to a man whom you know reads his trade paper and you see some of those qualities most to be desired; you will find a man with sympathies for his fellow craftsmen. You will find he is a thinker and very much of an enthusiast. Generally speaking, he will be possessed of some dynamic force in his association, or, on the other hand, a far more practical fellow all round than the one who has no time to look at his trade paper.

To hear a man say he subscribed to the paper but very seldom looked at it reminds us of a man who bought the corn but found he was too busy to sow it. Now, what do our trade papers really stand for? They first of all keep those in the trade posted up with all the news which is of interest to those engaged in their own particular line.

Trade papers excite and agitate our enthusiasm and push us along to a higher plane of success. They stand for progress along all lines, and particularly their own. They put into their reader a clear idea of his responsibility to his fellow tradesmen. They voice the sentiments of all those different tradesmen. They urge us on to become, each and every one of us, a part of the profession.

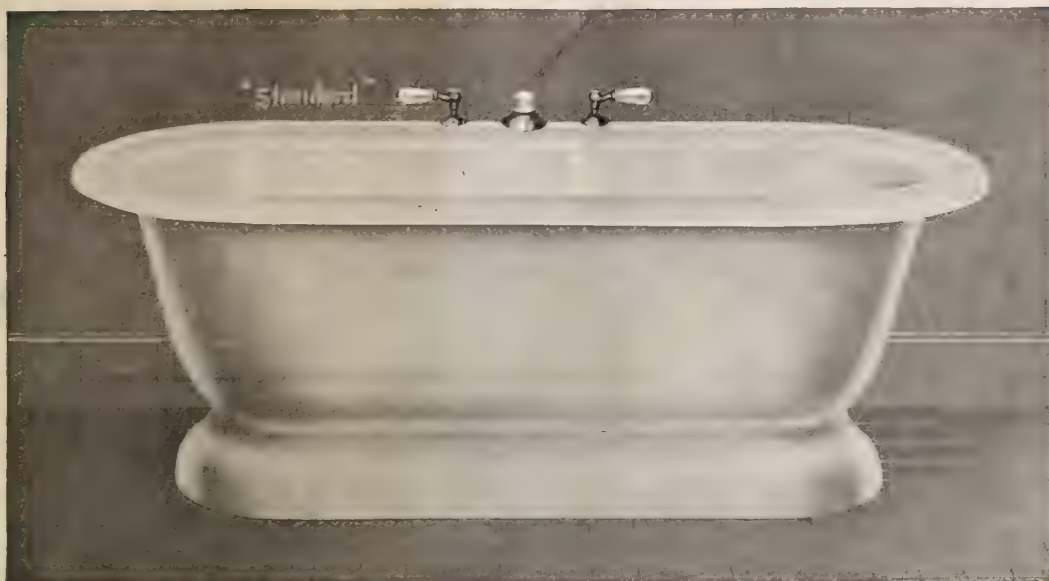
Twenty-five or thirty years ago sanitary engineers were a small band of engineers that humanity requires. The class of



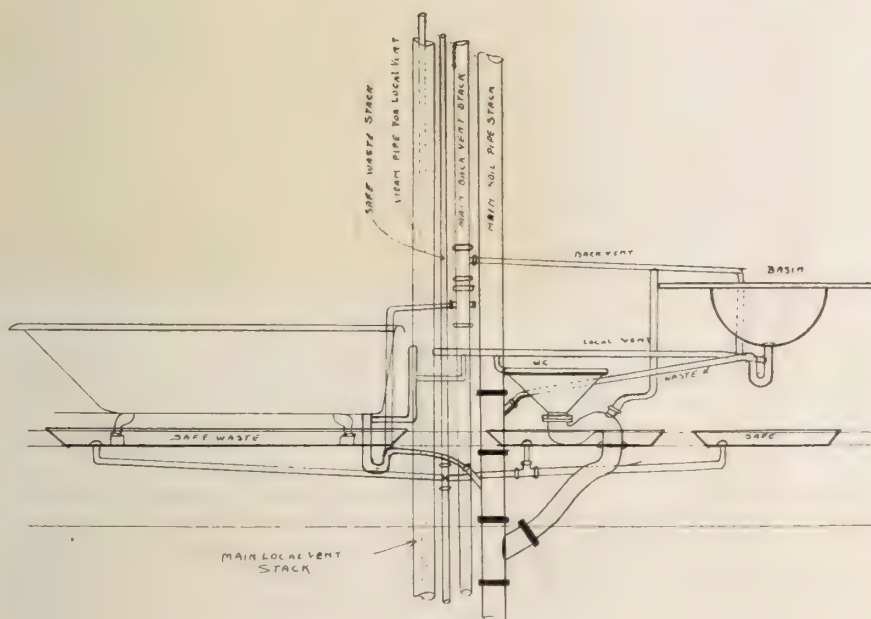
Old style closed in bathroom.



Up-to-date bathroom.



Typical up-to-date bath.



Old method of piping.

men to enter the field of sanitation will be those who read, mark, and learn all they can from their trade papers and all other periodicals which contain anything to enlighten them on any point. Trade papers are the medium whereby men with different views on subjects appertaining to their trade or profession can voice them in an unbiased manner. If read in a regular manner one will always find some point of interest discussed and will thereby have their viewpoint widened.

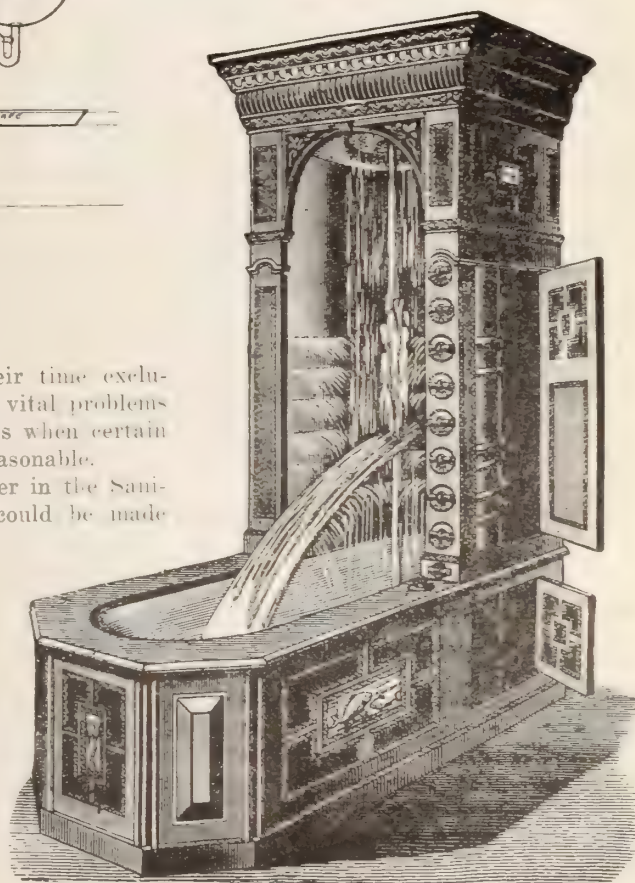
The editorials published from time to time must touch upon topics of interest, because they are based upon thoughts given out by one or more members of the craft. Those who are generally responsible for the writing of these editorials are men who have had long and wide experience both practically and theoretic-

cally. They devote their time exclusively to study the most vital problems in the trade, and at times when certain problems are the most seasonable.

The question and answer in the Sanitary Engineer columns could be made

more interesting if those who read trade papers would ask more questions or send in the results of their experiences so as to help along any who have not had those experiences. No trade in existence can show such varied experiences as the sanitary and heating engineer meets. When one looks back to the time when we were all PLUMBERS, and looks

(Continued on page 25.)



Old style bath with shower which in its time was the very finest and most up-to-date

The Analysis of Canadian By-laws

Other clauses which are embodied in the City of Toronto by-law to be taken up in this issue. Our first part of this by-law was commented upon in our issue of Sept. 15th.

FOURTH SERIES.

In our last issue we closed with comments on clause 40 of this by-law. Hence the next to be taken up will be clause 41, which reads as follows:

All drains and plumbing fixtures of every house or other buildings shall be provided with sufficient traps and vents to prevent gas from the sewers, drains, or waste pipes from escaping into any apartment; and each fixture shall have its own trap with sufficient vent, said trap to be placed directly under, and as close as possible to fixture.

This clause which in the main is very general, is also very good. The chief trouble with this, as well as most part of our city by-laws, is that it is only enforced when constructing new buildings or installing new sanitary engineering. The old installations are allowed to remain so long as not interfered with in any way and many fixtures are still in use which are connected up in some cases with as few as one large trap, say two inches for a battery of six lavatories.

Now this should not be tolerated for one moment. Why should this state of affairs be allowed? Those who are asked to conform to such a clause as No. 41 are being asked to conform and, in fact, forced to conform to what really is only proper. But old styles of fixtures and old methods of installations are still allowed to exist which are emitting foul air and obnoxious odors into our dwellings with impunity. Why not get after this state of affairs? Simply because it has been found that such old methods have been proved bad and injurious to humanity, is all the more reason these installations should be improved, and at once.

We enforce our new by-laws. Why not make those who have been, as it were, transgressing against the natural law, cease to do so?

The city fathers should see that these improvements should be enforced as soon as possible.

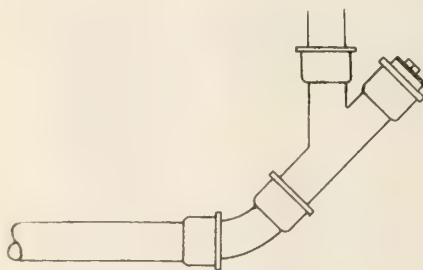
Clause 42 refers to fixtures not being allowed to drain through more than one trap, and the minimum size of vent which is allowed, viz., one and one-quarter of an inch in diameter.

Clause 43, which calls for several changes and has three sections. To properly define this clause we will here-

OMISSIONS IN OUR LAST.

In our last issue we mentioned we were producing several methods of making up branches and outlets with clean-outs attached. We produce them herewith.

Clause 43. No trap vent pipes shall be less than three inches inside diameter where it passes through the roof or outside wall, and all vent pipes must continue to rise after leaving the trap, and pass out through the roof or connect with soil pipe, above the highest fixture. Traps for basins and sinks, when half-S. or P. traps are used, may be vented by a continuous vent if centre of waste opening is not more than 12 inches from face of finished plaster or wall which they pass through or along, measured at right angles from face of wall — in all other cases location of trap vent will be governed by paragraph (C) of this clause.



(A) No trap vent will be allowed to connect to another vent below a point level with top of fixture for which it is used.

(B) A vent taken off a trap or lead bend under a floor shall be extended in the shortest way to nearest suitable wall or partition, and then extended vertically as high as required above floor-line.

(C) No slip or washer joint shall be allowed on sewer side of any trap or on any vent pipe.

Trap vents in all cases (w.e.'s excepted) must be taken off discharge side of trap or waste pipe, as shown in diagram—crown-venting will not

be permitted. No wrought iron vents will be allowed below top of cellar floor, or to be buried under any earth.

In the first part of this clause, mention is made that all vents, where passing through the roof, shall be no less than three inches.

It would be much better practice if four inches were called for, as in such cases it would permit this vent being used if necessary at some later date and would also be a better preventative against hoar-frost. Then passing on where crown-venting is not allowed, this too is good practice, no doubt. But instead of so much stress being laid on venting of traps, it would be far better practice if vents were only allowed where no other means could be adopted.

Our present laws on sanitation, when referring to back-vents, lay far more stress on their necessity than on the removal of the cause which makes them necessary. Why not use more anti-siphonic traps? The common S. and P. trap was the actual creator of the back-vent. Had they never been brought into use, back-venting would have never gained the prominence it has.

Section (A) is general in venting practice and so is section (B).

Section (C) is general except that mention is made of a diagram. But we have not had the pleasure of seeing any such diagrams, although they are necessary in every case where engineering work of this nature is to be installed. The writer has asked several members of the craft in Toronto if there were any charts or diagrams to be had, but was informed that no such thing existed.

These charts are just as necessary as the worded by-law and show in a far more definite way what said laws call for. However, we are producing what we feel is the proper way to back-vent traps so as to comply with this new clause in Figs. 1 and 2.

Another point is worth mention with reference to the material allowed in the vents or traps when same are intended to be buried. It would be far better if extra heavy lead pipes and traps were enforced, rather than the ordinary weight which is in common use above the floors.

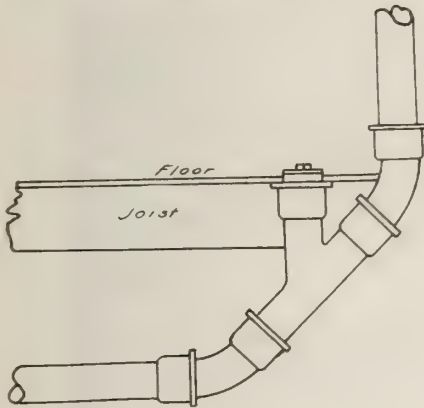
Clause 44.—The rule for soil pipe terminus as hereinbefore mentioned, shall govern said vent pipe.

This should not be so, but rather instead of increasing one size larger should be two inches larger, viz:—If a vent or soil pipe be 3 inches or 4 inches, they should be increased with an increaser to 5 or 6 inches respectively.

Such a measure would tend to solve the freezing up of the terminals which is a source of great danger to the inhabitants of our homes.

Clause 45 is a step in the right direction and should be embodied in every city by-law. It needs no commenting upon and speaks for itself, viz:—

No brass pipe used for waste pipes shall be less than No. 19 Im-



perial gauge in thickness, and all brass pipe and fittings shall be properly tapped and threaded.

Clauses 46, 47, 48, 49 and 50 are general and are found in almost every by-law on sanitary installations.

Clause 51 permits automatic vents when specially advised and sanctioned by the health officer.

Clause 52 deals with the weight of the different sizes of lead waste pipe, viz:—

1 1/4 inch inside dia.	7 lbs per yd.
1 1/2	8
2	10 1/2
2 1/2	13 1/2
3	16 1/2
4	24

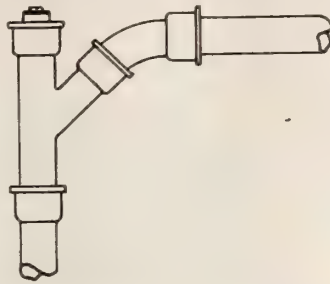
The next is clause 52, it deals with the weight of water pipe and is a good clause except that nothing less than 1/2 inch water pipe should be allowed under any circumstance, particularly in a large city like Toronto, where the distances are great from the pump house to some of the residences.

3/8 inch	4 lbs. per yard.
1/2 inch	6
5/8 inch	8
3/4 inch	10
1 inch	13

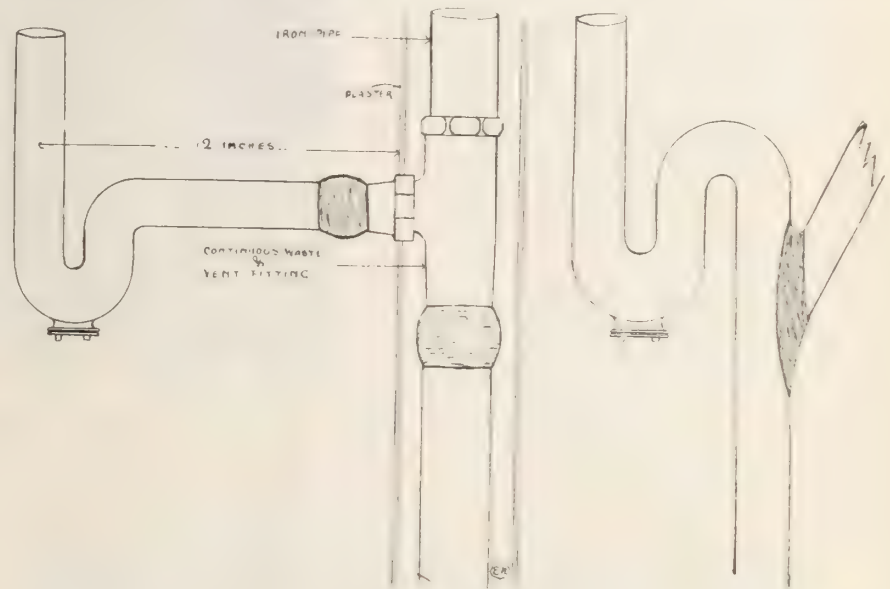
Several other clauses are general hence we will pass along to clause 67, which has some very good points in it.

We will herewith re-print it in full.

Clause 67.—Every water cock, bibb, tap or hydrant attached to any water service or pipe connected



with and supplied from the water-works system, shall have legibly stamped thereon, in a conspicuous place, the name of the maker, and shall be properly tested both as to strength and weight before being so



attached. Such to be made by the Toronto water works department, and stamped by them before being lawful for use in the city of Toronto.

On the whole this is a good clause, except that the weight is not specified. Neither is the number of lbs. pressure mentioned which these fittings are expected to stand. It is likely to be very inconvenient for all these goods to be first shipped to the water works department by the manufacturers then cleaned up again before they can be sent out to the jobbers. It would be far better to have the manufacturers submit samples to the water works department. Then this department could always be on the look-out for inferior goods, and in the event of finding any, to have the power to confiscate them.

The public would be guarded also. However, we believe the manufacturers are taking this matter up so as to arrange it to the satisfaction of all parties concerned.

In conclusion let us remark that each

set of by-laws should be accompanied with a set of working charts, showing the different kinds of fittings allowed as well as the way some of the pipe lines and traps should be vented.

The Lesson of a Meter Supply

Figures of Costs to Consumers of Water in Milwaukee Are Instructive—They Also Show Where And How the Meter System is the Most Equitable.

The subject of a metered water supply is one of great interest, not only in connection with economy of distribution but also in regard to the fairness of the method of taxation as compared with the flat rate assessment. The waste of water is also greatly reduced by the metered system with resultant economy to the taxpayer.

There is a metered service in operation in Milwaukee, and the figures accompanying this article were compiled

by the city engineer of that place. The average daily consumption of water in Milwaukee in 1912 was 47,556,000 gals., or 113 gals. per capita per day, but eliminating the 100 largest consumers, it was only 75 gals. as compared with nearly 200 in Ottawa. The actual cost per thousand gals., including sinking fund charges, depreciation, taxes, and 4 per cent. interest on net invested capital was 5.733c; the revenue based on total (Continued on page 26.)

The Collection and Disposal of Refuse

Showing the absolute need of prompt attention to this matter in all towns, irrespective of their size. Its engineering features should be interesting to our readers.

A important problem of municipal health is the removal and efficient disposal of house refuse with expedition, regularity, and at a minimum cost to the ratepayer.

There are two kinds of house refuse, liquid and solid.

The former is called sewage, and in all up-to-date towns is collected in sewers and discharged in such a manner as not to create a nuisance. In some instances, municipalities in Canada have had to abate nuisances caused by sewage by installing and operating disposal plants. In the case of liquid refuse, the work of collection and disposal is done by the municipality at the minimum cost and to the great convenience of the householder. Who would suggest a departure from this sanitary method? What town councillor or alderman would suggest reverting to the primitive system of individual disposal?

What shall be said then as to the collection and disposal of all the solid refuse of the modern home? With but few exceptions, the problem has not been properly met nor efficiently dealt with, yet all must admit that, for the sake of health and the improvement of slum and urban sanitary conditions generally, we have yet a long way to go before it can be said that this work of bettering home environment is efficiently done in Canada.

The city dweller has not far to go from home to find evidences of garbage ac-

cumulation which are a discredit to himself as well as to the municipal authorities. Fig. 2 is an example of how house refuse will accumulate on the premises of the working classes even in a city

left to the individual householder. Fig. 3 is an evidence that, in this particular city, the collection system was not operating as well as it should, and yet the same city was urging its citizens to



Fig. 2.—Garbage in a backyard in a large city of Ontario with a so-called system of refuse collection.

with some pretence to a system of refuse collection, while Fig. 3 illustrates how the failure to efficiently operate what is intended for a good system is attended with even more untidy and insanitary conditions than exist where the work is

‘swat the fly’—little use with so much decomposing refuse lying around in open barrels forming good breeding grounds for that pestiferous insect. The next illustration, Fig. 4 is another good example of what occurs where the collection of refuse is not systematically carried out by the authorities. The garbage cans themselves become a nuisance—two of the lids are gone and the containers are full to overflowing.

As exhibiting the effects of a failure to have any civic system of refuse collection and imposing the work on the individual householders, Figs. 5 and 6 indicate the manner in which lanes become littered in two of our smaller cities.

Having illustrated a few of the features incident to the neglect and inefficiency of the health department, and the carelessness and indifference of the householder, attention may be directed to the unsatisfactory, because unsanitary, manner in which health authorities permit a department of the civic government to dispose (?) of what is collected, by depositing refuse of all kinds at the ‘town dump.’ Fig. 7 is a small section of the dump of a city of some 40,000 inhabitants. Here may be found bits of paper, mattresses, old cans, iron bed-



Fig. 3.—Refuse on a private road once in a Canadian city; a reflection on the Health Department.

steads, wire springs, glass, pots and pans, manure and decomposing vegetable matter—all, indeed, that goes to offend the eye and common decency. Nothing is burned, and no effort is made to deposit the refuse in an orderly manner or cover it up—all this within the city

inconvenience, for it is not an easy matter to find a person ready and willing to act as scavenger. Even if one can be found to do the work, the difficulty is to find a suitable place for depositing the rubbish without running the risk of creating a nuisance.



Fig. 4.—In a back lane of a city with a system of refuse collection improperly managed.

limits and in close proximity to a large public institution. The land around is littered with paper and light material carried by every wind that blows. The municipality should be indicted for maintaining a common nuisance detrimental to health. The next illustration (Fig. 8) is a horrid example of a city dump, a portion of which has been used for an emergency hospital. No attempt has even been made to put a top dressing of lime and clean earth over the gigantic rubbish pile. It is a pity the civic aldermen and officials were not compelled to occupy these tents and spend their summer vacation at this health resort (?) and suffer something of what they condemned the city's sick to endure for weeks at a time. It is more than probable there were more rats than nurses and patients. Certainly the mayor, the medical health officer, or members of the local Board of Health were not amongst the patients sentenced to this Gehenna.

The responsibility for the keeping of one's premises in a sanitary condition, that is, clean and free from an accumulation of domestic waste, is placed upon the head of each household. In rural districts and small towns and villages where there is plenty of ground, it is possible to burn up most of the refuse and bury the indestructible portion in the ground. The city dweller, being cramped for space, cannot dispose of the waste in this manner. He has to allow it to accumulate either in barrels, boxes, sometimes in covered bins. When the municipal authorities fail to provide the ways and means for its regular and systematic removal he must remove it at his own cost and often at considerable

At the present time we hear much of the "clean-up week." This is nothing more than a public avowal by the health authorities that they have no system of refuse collection and disposal. In other words, the authorities simply allow their municipality to be kept in an untidy and insanitary condition for 52 weeks, and then make a grand display of civic incapacity by trying to get rid of a large amount of decomposing and other refuse at one fell swoop. Then with a loud

ing to keep the town clean. We should not follow the deplorable example set us by the large American cities. Rather we should teach the boys and girls that keeping the home premises clean and free from refuse day by day is just as necessary as cleaning their teeth daily. What is wanted in Canadian towns and cities is system in the matter of refuse collection and disposal, and each child should be taught that it is better and easier to keep the premises clean than it is to clean up premises that are allowed to become defiled with rubbish of any kind.

It should be the duty of each ratepayer to insist upon it that the work be instituted under civic control, not only as a matter of economy and civic pride, but, what is of infinitely more importance, for the health and comfort of all. Men, women and children may 'swat the fly' as hard and as often as they like, but should devote a little of that same energy to 'swatting' the councillors until they bestir themselves and inaugurate a system of refuse collection. More will be done in this way to rid our homes and our cities of flies than ever was thought possible.

One very important point in refuse destruction is overlooked. It is the possibility of burning a certain amount in the kitchen stove. Quite a percentage of the refuse thrown into the yard or lane and then carried by the wind to the uttermost parts of the city could be burned in the furnace or stove. Examine a "dump" or watch a scavenger's waggon and see how much it contains of

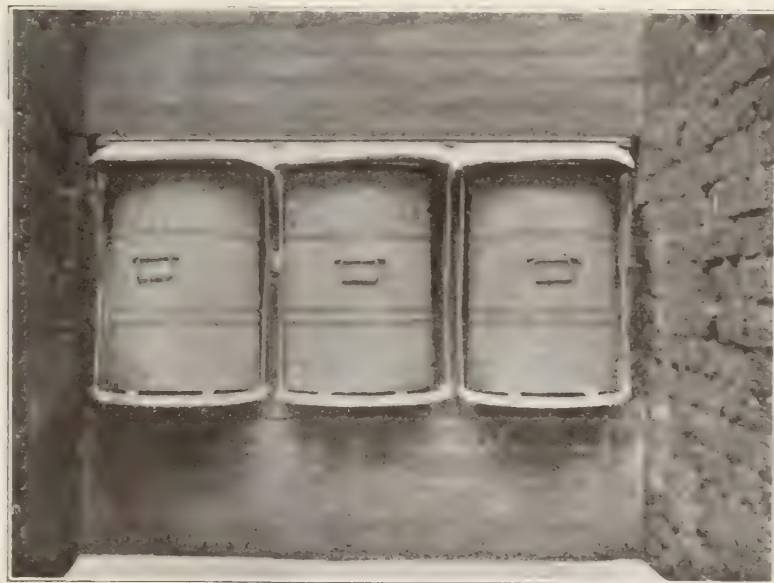


Fig. 5.—A well regulated system in operation: note elevation above rain splash, children and animals; can be operated in winter.

"hurrah" they proclaim the city clean. There is no necessity for this enlisting of school children, boy scouts and girl guides in spasmodic efforts at attempt-

material of this kind. Then ask yourself, 'How much do I burn at home?' Remember, too, that each pound you burn at home lessens the amount to be

removed from your premises, and reduces the cost of removal.

It is as essential that the civic authorities should make proper provision for

of lime and clean earth so that its objectionable features may be reduced to a minimum.

The installation of a civic destructor is

English destructors, the efficient as well as the economic working of them depends largely upon intelligent and constant supervision. The maintenance of high temperatures is to be obtained only by continuous feeding. In addition to the regular and proper feeding of the cells, it is necessary for the prevention of nuisances that the fires be stoked regularly and systematically, and that the blast be cut off each time during the clinking process.

Given a good destructor and proper management, civic waste and house refuse is reduced to about one-third its original bulk, the residue being innocuous clinker, metallic refuse, and dust.

Fig. 10 will be found on page 25.



HINTS TO HOUSEHOLDERS.

The following hints to householders, issued by the Health Department of the city of Winnipeg, are so practical and good that they should be followed out in every city in Canada:

"With the approach of winter, a few hints as to the keeping of refuse during the cold weather will not be out of place.

"If householders will carry out the following suggestions and adhere to the regulations issued by the Health Department, they will assist the scavenger in his duties and will save themselves much annoyance and expense.

"Average householders are more or less careless about the way in which the refuse is kept during the winter, and immediately the warm weather begins to



Fig. 5.—Littered lane in the central portion of a small Canadian city.

the collection of solid waste as they do of liquid waste (sewage). If each householder had to barrel the liquid waste and be responsible for its careful disposal, what a mess there would be! And it would reach its worst in the homes of the poor. It is bad enough now when there is inadequate water-closet accommodation. Then why, in the interest of the health, happiness, and morals of the masses, should we not have in all our cities a civic system lessening the evils of slumdom and tenement dwellings. We should make each day a 'clean-up' day, so far as refuse is concerned.

The civic system should include the following points:

(1) The selection of a suitable container—one for ashes and old cans, etc., the other for household waste.

(2) The regular and systematic collection of the same.

(3) The disposal of the waste either at a suitable supervised dump or, preferably, at a destructor.

Fig. 9 shows a container properly placed on the premises so as to be above the reach of cats and dogs and yet permitting the full use of the can in winter time.

The authorities must make provision for the collection, not only of the cans and ashes, but for the removal of other material, such as beds and articles too bulky for the containers. Where a "dump" is operated, it should be placed in charge of an official, and as much of the paper and combustible material as possible burned. Care should be taken to carefully cover the dump with a layer

advisable where finances will permit, and a type such as that in successful operation in Westmount, Que., for some ten years, is strongly recommended. This plant is of the English type, a high temperature, forced-draught type which has stood the test of experience. The clinker from these destructors makes a good foundation for roads or walks, and, as power plant, operated by the heat



Fig. 6.—Lane in the centre of a Canadian city at Midday; uncollected refuse.

evolved, may be instituted as part of the system. Fig. 10 shows the Westmount destructor.

Speaking in general terms of the

appear, they awaken to the fact that they are loaded up with all kinds of rubbish, and they usually end up by complaining that the scavenging depart-

ment is not giving the attention to its work that it should do.

"This department finds that no less than 90 per cent. of the complaints re-

"Ashes must be stored in fireproof receptacles if you want them removed during the winter months, and the receptacles must be of such a size as not

in the basement or woodshed during the winter and then expect this department to remove an accumulation of six months in a few days in the spring.

"Burn as much paper, rags, straw, etc., as possible, and so keep the city's streets and lanes clean. If this is impossible, tie it up in bundles and place it in a covered box near the garbage can.

"Owing to the fact that this department is so seriously handicapped in spring in removing the winter's accumulation of refuse, and, as this accumulation could easily be prevented if each householder would do his little mite and keep all refuse in order and not hoard it up inside during the winter months, it is earnestly requested that every citizen of Winnipeg will do his share by carrying out these rules and suggestions, and so make the work of the department easier and more efficient than it has ever been before."

Men, women and children of Canada, let your watchword and your work be for clean homes. Individual responsibilities properly discharged will produce a great uplift in home life throughout our Dominion. Lend your aid. Then we shall have clean cities, towns and villages, with health for all.



"Sanitary Engineer" is indebted to the Dominion Conservation Commission for this very interesting article. This question of garbage disposal is a matter of engineering of the best type, because it not only needs to be disposed of finally, but also economically and at a pro-



Fig. 7.—A typical and disgraceful city dump; no attempt on the part of municipality to burn refuse or cover up fermenting mass.

ceived are unjustified, being due either to the neglect or sufferance of the occupier or owner of the premises in not complying with the regulations of the department.

"During the cold weather particular attention should be paid to the kitchen refuse. This class of refuse usually contains more or less moisture, with the result that, when placed in the garbage can, it freezes solid and has to be removed by an iron bar, much to the detriment of the can. If householders would wrap their kitchen refuse in paper before placing it in the garbage can, their receptacles would last ten times as long, the scavenger would save a lot of time, as the contents would be easily emptied, and the can would always be sweet and clean.

"Do not place anything in the garbage can but kitchen refuse, and always drain all the water from it before doing so.

"Do not keep your can or any other receptacle inside the building; the scavengers are strictly forbidden to go inside for receptacles. If there is a lane at the rear of your premises place your can near it, and not just outside the kitchen door. By doing this you will save the scavengers many miles of walking in a day, and you will consequently get a more frequent and better service.

"Secure your can from being turned over by dogs by driving a stick through one handle firmly into the ground.

"Pass a chain or wire through the handle of the lid, secure it to the fence by a staple and you will never lose it.

to hold less than 27 cubic feet. If you do not want ashes removed until the spring they may be placed on the ground, but they must be so placed as to be convenient for loading into waggons.

"Ashes are not removed by this department from places of business, from blocks containing offices or stores, or from public or private institutions.

"Incombustible refuse must be placed



Fig. 8.—A capital city using site of town dump for temporary Smallpox hospital; note the accumulated refuse.

in covered boxes so as to exclude snow, and they should be placed at the rear end of the lot when there is a lane. Do not keep your empty tins and bottles

fit. The City of New York gets almost \$100,000 for her garbage. Other cities should look into this with the same object in view.



The Question Box

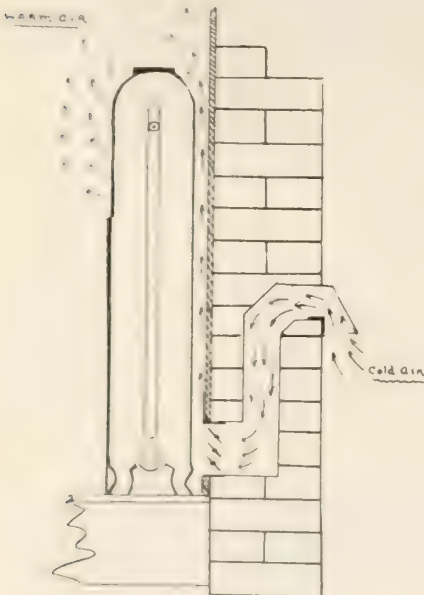
Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



A DIRECT-INDIRECT RADIATOR.

Editor of the Sanitary Engineer.—

Could you please inform me in an early issue what kind of a radiator would be used for direct-indirect steam or hot-water heating.—A.H.E.



We herewith show an outline cut of a direct-indirect radiator which almost speaks for itself. The idea is that fresh air is drawn from outside, and the radiator is so constructed as to cut off the cold air from entering the room except through the radiator. This air can be controlled by a set of adjustable shut-off valves.—Editor

COMMENTS ON ABOVE.

It is rather to be regretted that so few of these kind of radiators are used. There should be one or two at the least in every house, thus ensuring a certain amount of fresh air entering our homes.—Editor.

WHAT IS A BRITISH THERMAL UNIT?

Editor of the Sanitary Engineer.—
Please inform me through your next

TO READERS—

We repeatedly ask our readers to send in any good wrinkle or kink they pick up through their daily experience, and we know every one who is studying and practicing the trade knows lots of good ones. We can write them up by the load, but we wish our readers to become interested in this series of "Shop Notes." They would then be bound to be of more value to each and every one, for instance, how many of our readers can describe the correct method of connecting up a right and left coupling without putting more strain on one side than the other. That is just an instance. So let us see more interest taken in these columns.

Further we wish your comments on any article you read, by so doing we find the amount of interest your readers have in the paper. It is the only Canadian publication which is interested in Sanitary and Heating problems.

issue of Sanitary Engineer what a British thermal unit is.—Yours, a Subscriber.

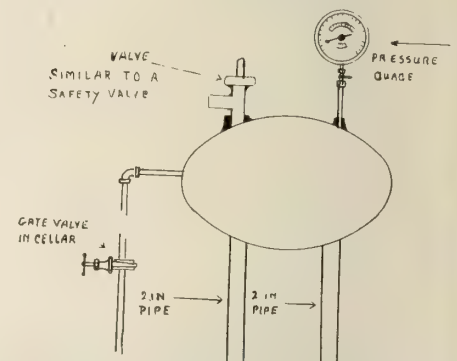
To create a British thermal unit (B.T.U.) is to raise the temperature of one pound of water one degree Fahr., viz., if you take a vessel containing one pound of water which is, say 40 degrees Fahr., and apply heat to it until the water registers 41 degrees, you have raised the temperature of the water one B.T.U.—Editor.

A CLOSED PRESSURE JOB.

Editor of the Sanitary Engineer.—
Will you kindly explain this hot water job which I happened to run across the

other day. I do not understand the principle of it. I herewith enclose a sketch of the expansion tank which is cast iron. The pipe coils have no air vents on them. Hoping you will answer in your next issue of Sanitary Engineer, and oblige.—S. Fitter.

S. Fitter has evidently run across a very old installation, which is one of those where the person who installed it was trying to put a slight pressure on the system. It would be called a closed



pressure job, and the safety valve is set at whatever pressure is desired. For instance, we will presume the whole system is finished and ready for filling. The water is turned on, and the pressure is relieved to say 5 lbs, then closed. The heat is put on, and the expansion will then raise the pressure, which is also relieved till the desired pressure is reached. There have been scores of freakish jobs installed in the endeavour to put a slight pressure on hot water jobs. But only until recently has this been satisfactorily accomplished by using one of the popular heat generators, of which there are several. If S. Fitter will send us his address we will be pleased to take a photograph of this installation and give more details to our readers which, we feel sure, would be very interesting.

Battlefords, Sask.—J. D. Wright has discontinued his sanitary and heating business.

INTERESTING EVENT.

BAKEMEYER—PEPPLATT.

A quiet wedding was solemnized at three o'clock, September 24, in Saint Luke's Church, the Rev. G. F. B. Doherty officiating, when Gertrude Margaret, daughter of Mr. and Mrs. George Peppiatt, Breadalbane street, was united in marriage to Mr. Charles H. Bakemeyer, of Indianapolis, Indiana. The bride was given away by her father, and wore a smart tailor-made travelling suit of blue serge and velvet hat to match. Miss Lillian McDonald was bridesmaid, and Mr. Harry Peppiatt, brother of the bride, was best man. Only a few immediate relatives and friends were present, including W. H. Martin, of Steel & Radiation Co., Ltd., Wm. Jury of Gurney Foundry Co., Ltd., E. T. Needham, T. B. Smythe and wife, Chas. Hicks.

Charles H. Bakemeyer is well known throughout Ontario and other parts of Canada. He has been representing the Canadian Wolverine Brass Manufacturing Co., Ltd., for over 6 years. His personality is a pleasing one, he is not only a good salesman, but is a good fellow. His friends wish him well and "the boys" in and round Toronto will miss him. After the happy couple return from their honeymoon which will last until Jan. 1st, 1914, they are to take up residence in Winnipeg. Mr. Bakemeyer will then take over the Western Canadian business of this company mention-

some very lasting and faithful friends who hope to see him again when on pleasure bent in this district.



TRADE PAPERS AND THEIR USE.

(Continued from page 17.)

along the lines of progress which we have passed through, and then take down one or two old books dealing with pro-

tems of steam heating are taking its place.

Look at the way sanitary engineering was installed in those days, when safe wastes, force vent stacks, heated by having a steam pipe run up the centre to actuate a suction of the air through these pipes, when every fixture had to be empanelled in wood, and any exposed piping was considered very bad practice.

Just to illustrate a few changes which have taken place we will produce a few



Fig. 10.—Garbage destructor at Westmount, Que. Power house and cooling pond in foreground; boiler and Incinerator room in rear.

blems as they were found at that day, how contradictory some of the ideas held at that time have been found to be.

What strange ideas we had relating to

cuts, one of a bathroom of the past, one of an old method of piping, and one of an up-to-date bathroom, and two others, all on about the same scale. Then give a thought as to what portion of this progress can be claimed by our trade papers. Certainly the credit is due the trade Press.

Look at the evolution which has taken place in our methods of advertising the make-up and style in general. Manufacturers who had goods to dispose of have realized the importance of trade papers by using them as a chief medium whereby to bring their goods to the notice of the trade. One of our highest authorities on advertising made a statement at Baltimore recently that trade papers were the very best medium the manufacturer and jobber could use to bring their products before those who were the most interested buyers.

In conclusion, let us quote the words of a member of one of the largest and strongest associations in the U.S. when speaking of trade papers. "The trade papers are equipped to grind our enthusiasm in unknown quantities. All they need is the grain, and it's up to us as members of the craft to provide ways and means to secure the material needed."



ed, with territory covering the whole of Manitoba and Saskatchewan, and while those in the vicinity of Toronto will miss his personality in the flesh he has left

steam and hot water heating. The simple plan of one pipe-system would have been scoffed at 25 or 30 years ago. To-day it is dying out, and vacuum sys-

THE LESSON OF A METER SUPPLY.

(Continued from page 19.)

pumpage was 4.676c per 1,000 gals., and based on the total for which the city actually received payment, 6.257c per 1,000 gals.

Classification of Water Consumers, Milwaukee, Wis.		
1,185	pay less than \$0.50 per year	2.10%
6,447	pay between \$0.50 and \$1.00 per year	11.00%
15,182	pay between \$1.00 and \$2.00 per year	26.33%
10,856	pay between \$2.00 and \$3.00 per year	18.48%
7,157	pay between \$3.00 and \$4.00 per year	12.41%
4,899	pay between \$4.00 and \$5.00 per year	8.50%
8,017	pay between \$5.00 and \$10 per year	3.86%
595	pay between \$20.00 and \$30 per year	1.00%
271	pay between \$30.00 and \$40 per year	0.47%
167	pay between \$40.00 and \$50 per year	0.29%
376	pay between \$50.00 and \$100 per year	0.65%
428	pay between \$100 and \$500 per year	0.76%
66	pay between \$500 and \$1,000 per year	0.11%
80	pay between \$1,000 and over	0.14%
57,657		100.00%

The advantages of a metered supply should be obvious. Wilful waste is done away with and the charges for water can be equitably adjusted. In the case of Milwaukee one hundred of the largest consumers paid \$402,563, or nearly 50 per cent. of the entire revenue of the water department during 1912. Of the water consumers of Milwaukee, 58 per cent paid less than \$3.00 per year and 70 per cent.—over two-thirds—paid less than \$4.00. Can any eastern Canadian city make anything like as good a record?

During 1911 and 1912, on account of a threatened shortage in the supply, a vigorous campaign to prevent water waste was carried on in New York city. The methods generally employed were as follows:

(1) The attention of consumers was called to the necessity for checking waste.

(2) A team to locate leakage was carried on in order to detect and repair leaks.

(3) An examination was carried on with the object of locating and repairing underground leaks.

(4) Connections were metered where the cost of metering and the existing conditions of the supply warranted this measure.

The results obtained were noteworthy in many respects. The estimated daily reduction in consumption in Manhattan and the Bronx reached a maximum of 71 million gallons in August, 1911, averaged 65 million gallons for the last six months of 1911, and almost 50 million gallons for the year 1912. The aggregate value of the water thus saved, if figured at meter rates, \$133 per million gallons, would be nearly \$6,500,000 while the total cost of the work was only \$167,000.

These figures are also interesting in so much as they prove that no unnecessary water works expenditure is made on account of waste water.

There are cities in Canada to-day which if the meter system was to come into force their water works would be found to be large enough for years to come.

Not only would the meter system save money but it would cause a better pressure to be always on the mains for fire purposes. The constant leaks take up a lot of pressure which is never available but rather a constant drain on the present pumping stations, which are as it were struggling to maintain the necessary pressure.

MARKET REPORTS.

Enamelware.—There is a very steady demand for enamelware for this season of the year. This is accounted for by the large number of buildings which are all roughed in and on the point of completion. There is a large quantity of higher priced goods being called for too in comparison with the other classes of material.

Brass Goods.—Brass goods, like enamelware, is in fair demand which is too accounted for by the finishing up of buildings under construction. If anything the demand seems to be a little better than expected for this season of the year.

Soil Pipe. — Soil pipe is keeping up well. Jobbers state this commodity is even in better demand than was expected it would be for this season of the year. But while the demand is fair, the factories are not in anyway rushed.

Black and Galvanized Pipe. — No change in prices of black or galvanized pipe, demands are a little lighter than has been. This is on account of the

heating engineers having their contracts about completed, and also allowing their stock to ease up for the winter season.

Fittings.—This commodity is a little quiet, we are told, the same conditions prevail as with the piping.

Tin.—A little easy and rather quite. Demands are fair but prices are very easy, no change is expected at present.

Solder. — No change is reported in solder. This of course is governed by the tin and lead markets. When they are easy why of course solder shares the same condition.

Collections.—Collections are reported rather quiet and if anything are a little worse, of course this may be on account of some of the contracts nearing completion and awaiting their final tests and handing over to their respective owners.

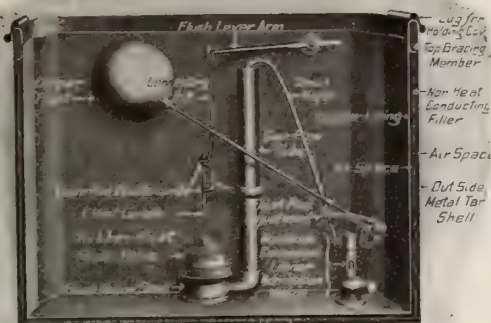
Copper. — Copper is reported very mild with every inclination for a drop in price which of course is not anticipated to be of a serious nature.

NEW BRANCH IN GALVESTON.

The H. W. Johns-Manville Co. informs us of having opened a new branch in Galveston. This new addition to their many offices will enable them to receive shipments by coastwise lines from New York direct thus dispensing with troublesome transshipping and give better deliveries to their patrons in and around Galveston.

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You cannot install a closet combination which will give customers more satisfaction. The All White "Met-All" is the proven best in service, and handsomest in appearance.

The entire tank is made of metal, except the non-heat conducting filler which separates the water reservoir from the outside shell. This filler entirely prevents the gathering of moisture on the outside, commonly known as sweating. All the fittings are of the highest grade. The shell is made of a specially prepared metal and beautifully finished on the outside with a sanitary enamel, which does not discolor, and can be kept bright and new by simply washing.

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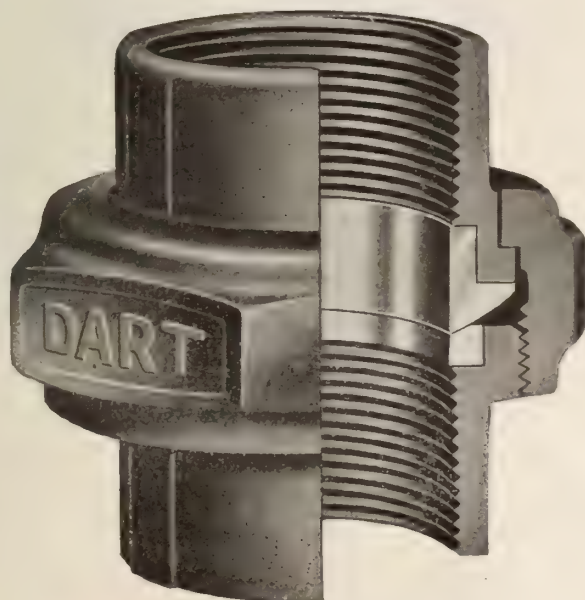


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A Confidential Chat With the Publishers

The editor of a technical publication, such as The Sanitary Engineer, has to avoid two extremes, in preparing the reading matter for his paper. And we confess that we consider it just as difficult as it is important, to steer a middle course between these two extremes.

In the first place, there is a danger of making the articles too technical. All over the world there are immense projects under way, which are closely related to sanitary or heating engineering. The problems they involve, are complicated in the extreme, and, though it would not be difficult to fill a good portion of our paper with detailed descriptions of such work, we doubt whether you, our readers, would appreciate them.

An occasional article of this kind is bound to be interesting, as showing the advance of sanitary science. But there are few readers of The Sanitary Engineer, who will come into actual touch with such immense work, and we realize the danger of such reading matter being over the head of the average sanitarian or heating engineer, and consequently of no practical benefit to him.

On the other hand it would not do our readers any good to tell them about simple little problems such as they themselves have solved many a time, and many years ago.

Suiting the Ordinary Mortals.

Realizing, as we do, the difficulties of accommodating the reading matter of The Sanitary Engineer to the requirements and expectations of its subscribers, it certainly pleases us a great deal to receive a letter from one of our readers, such as this:

"We are very much pleased with the contents of The Sanitary Engineer, and the general get-up of the paper. We are impressed with the practical part of it, and ask to be excused for hinting that we find many papers aim so high that ordinary people don't see where they hit. There seems to be a lot of ordinary mortals in this world. Keep your paper on their level and it will continue to be a success."

That is just what we intend to do, and perhaps we shall better succeed in keeping on the level of our readers, because we are actually on their level.

Editor's Practical Viewpoint.

The Editor of The Sanitary Engineer has been, himself, a sanitary and heating engineer having risen from the ranks of the journeymen. Latterly he has been manager of a brass foundry making a number of articles used by the sanitary and heating trades.

He is nothing, if not practical. He knows exactly what the average sanitary and heating engineer is up against, and he is fully alive to the kind of reading matter that will interest and help his fellow craftsmen.

So, we feel that we can promise to keep The Sanitary Engineer on a level that will be appreciated by the important trades which it is designed to serve.

Subscription List is Growing.

It will be good news to the readers of The Sanitary Engineer, to know that the two months of August and September, have added more new subscribers to our list than any similar period since the paper was founded six years ago.

It does not take a good live sanitarian very long to see that The Sanitary Engineer is exactly the kind of paper that is going to help him to a better understanding of his business. And the heating engineer recognizes that so many developments are taking place in his profession, that he cannot hope to keep in touch with improvements in equipment and methods of installation, without regularly studying a practical newsy paper devoted to the subject with which he is most familiar.

A Canadian Paper For The Canadian Trade.

Another thing which is adding to the popularity of The Sanitary Engineer, is that it is the only Canadian paper devoted to the sanitary, heating, and ventilating trades. It is the only means of letting Canadians in these trades know what other people in the same line of business, are doing, in other parts of Canada.

Canadianism is just as evident among sanitary and heating engineers, as in any other line, and, so long as a Canadian paper, of standing, is serving the Canadian trade as faithfully as is The Sanitary Engineer there will be no need of foreign publications, only a tithe of whose contents are of any interest to Canadians.

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troubles

A flushing valve that needs frequent adjustment and repairs is a constant source of annoyance, both to your client and yourself. Eliminate this worry by installing the J-M Valve.

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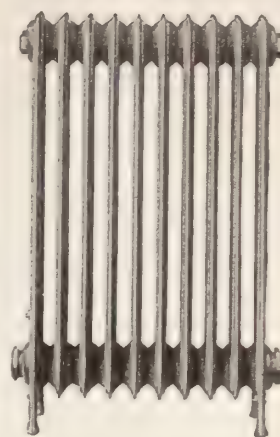
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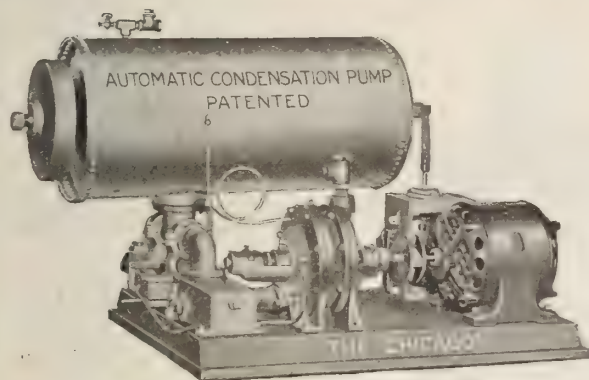
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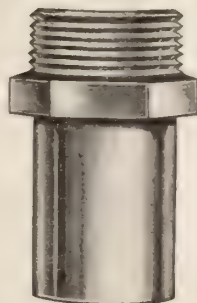
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Used correctly this tool will provide for more kinds of service than any other made for similar purposes.

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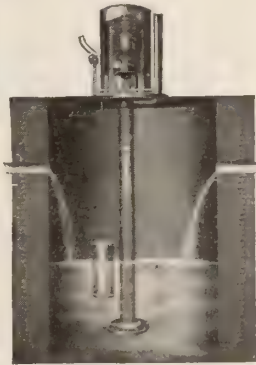
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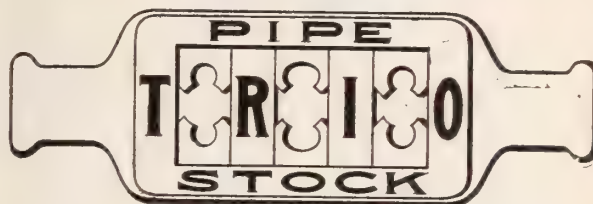
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A condensed ad. in
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—fell down the elevator
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What Did?



It's the ideal rough and
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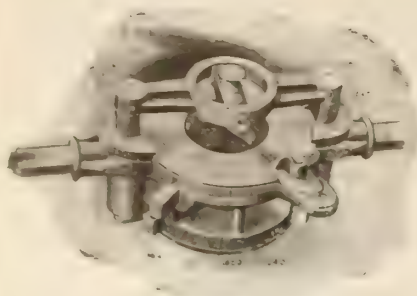
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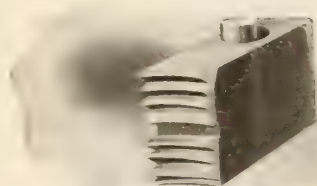
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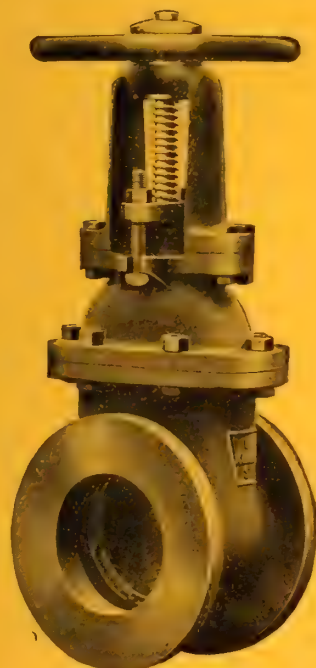
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GALT BRASS CO., LIMITED
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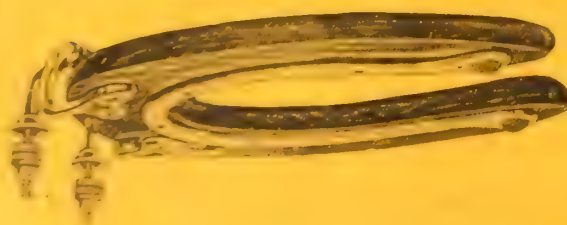
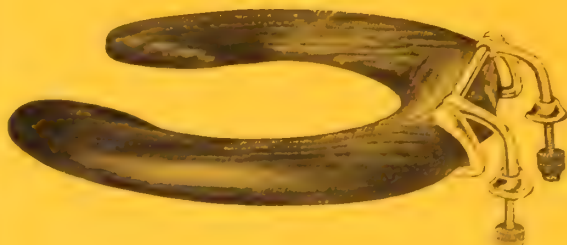
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Vol. VII.

Publication Office : TORONTO, OCTOBER 15, 1913

No. 20



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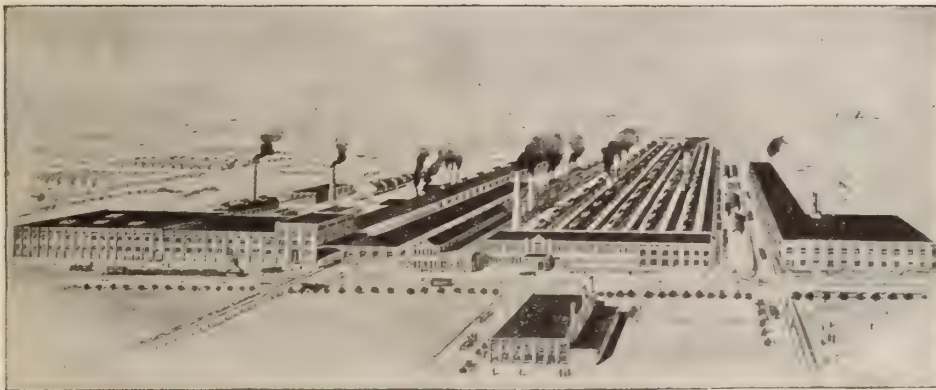
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Design P-55.

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Lavatory is the "Standard Sanitary" "Narova" design, a pattern that has proven very popular on account of its handsome appearance and excellent quality. It is enamelled all over, free from cracks and crevices, and is easily kept immaculately clean and sanitary.

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All Closets of this type, operating on direct pressure, should be supplied with water at a minimum pressure of ten pounds through a full 1¼-inch I.P. size supply pipe to each Closet.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

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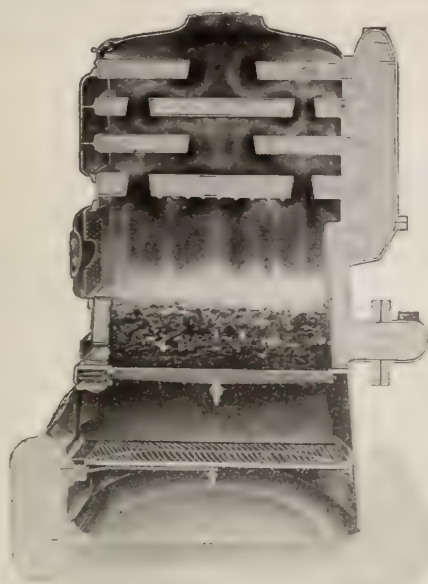
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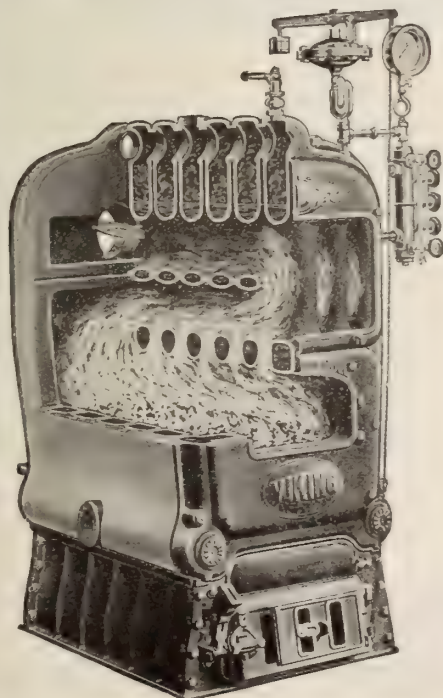


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 The MECHANICS' SUPPLY CO., QUEBEC, QUE.
 The JAMES ROBERTSON CO., Limited, ST. JOHN, N.B.
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We are the largest manufacturers of Soil Pipe and Fittings in Canada. Also Steam Fittings, Stable Fixtures, &c.



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“VIKING”
BOILERS

For STEAM or HOT WATER

Are Giving Great
 Satisfaction

They are easily regulated
 and kept clean.



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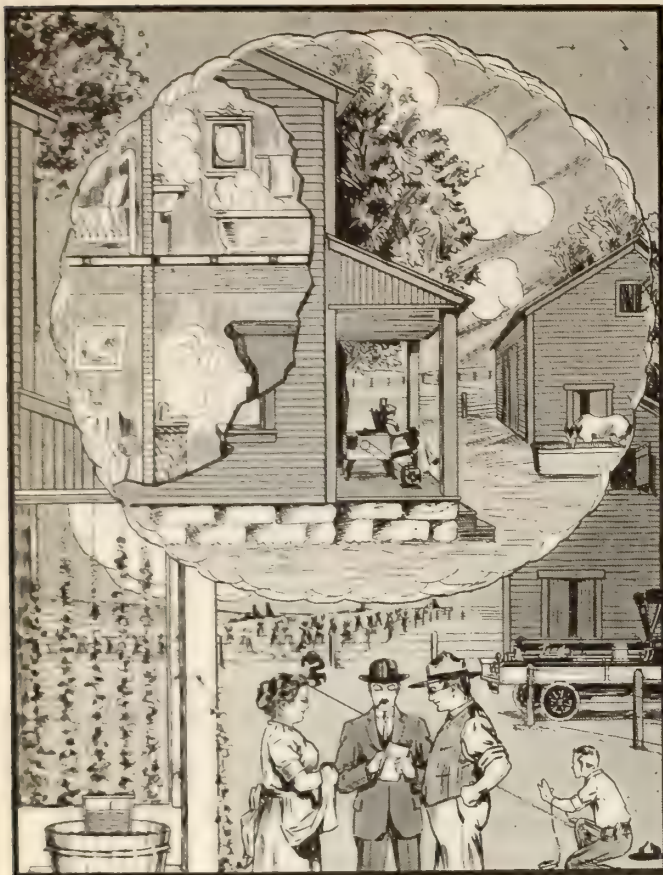


Illustration taken from front cover of Leaderite, October issue, published monthly by the Leader Iron Works.

Some Dreams Come True

¶ The boss of the household is sometimes handicapped because the King of the outdoor work feels it his duty to handle the water supply question, and very often the interest centers more on a convenient supply of water for the barn yard rather than the house.

¶ It is time well spent by the dealer to make it a point to visit the home of a prospective water supply customer and talk the matter over with the family. This may at least lead to an order for a soft water system and considerable plumbing work, in addition to the hard water system.

Leader Water Supplies

¶ Cover such a variety of convenient appliances for the farmer or suburbanite that nearly everyone in rural districts is in the market at some time or other for this class of material. So you have a good excuse to call whenever you are near a home that is not equipped with a substantial water supply.

Attractive Prices.

¶ Just at this time, even though you have a regular trade discount on file, it will pay you to keep closely in touch with the Leader prices (see October Leaderite) and take advantage of what is being offered in both hand and power outfits. Drop a line to nearest office and see what is being offered at a special rate that would interest you.

Leader

"Our mark of gold is a symbol of everlasting value."

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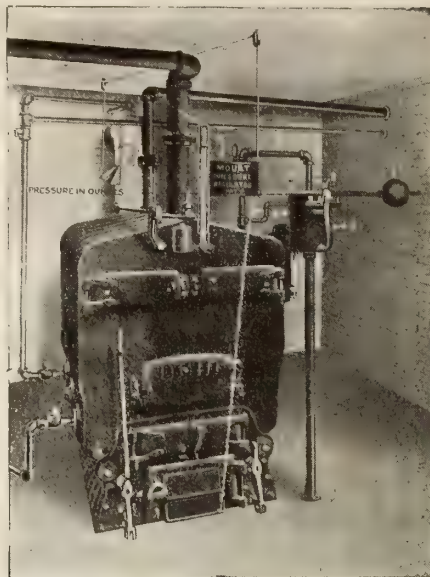
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The Mouat Graduating Vapor Heating System

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

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Iron Pipe Size.

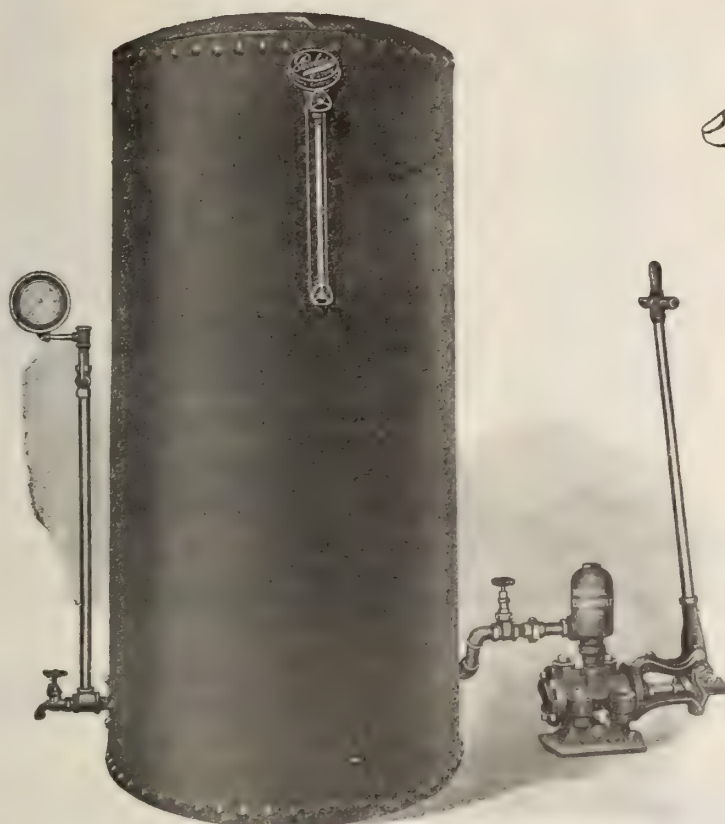
Brass and Copper Tubing.

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Tallman Brass & Metal Co.
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A Simple Peerless Water System



Count the Fittings in this Cut

Could you put them together
in half an hour?

How much longer would it
take you to line and instal the
old-fashioned attic tank?

When finished, which would
most enhance your reputation
as an up-to-date contractor?

Which would make for you
the most money per hour?

Figure 112 B with vertical or horizontal tank as desired, with our latest improved pump, having raised discharge valve which cannot "airlock," ratchet handle that cuts down the labor one-third AND AN ABSOLUTELY UNLEAKABLE AIR INLET.

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Price List.

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- Fig. 112 B with 30x6 tank, list price \$ 92.00
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- Fig. 112 B with 36x10 tank, list price \$135.00

National Equipment Company, Limited

Toronto, Canada

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JENKINS BROS.' VALVES

TYPE "K"

IRON BODY

BRONZE MOUNTED

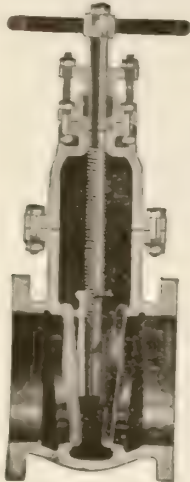
GATE VALVES

GOOD FOR WORKING STEAM PRESSURE OF 125 POUNDS

Every Valve Guaranteed Tested to 300 Pounds (Hydraulic)

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SPLIT WEDGE PRINCIPLE

Fig. 402
(Sectional)

Elliptical in design.
Made from best material
Handsome in appearance.
Have taper seats.
Bronze-seat rings screwed in.
Stuffing-box can be re-packed
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closed.

Look for the Diamond Trade
Mark, which is cast on the
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Stocked by all up-to-date
Dealers

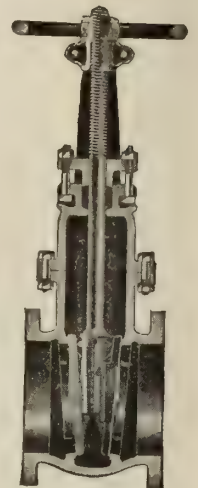


Fig. 403

Even distribution of metal.
Great strength of all parts.
Opening equal to full capacity
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Iron discs—bronze-faced.
Heavy thread on spindle.
All parts interchangeable.

Do not accept substitutes, as
they are apt to be a source
of trouble and inconvenience.

Catalogue Mailed Free
Upon Request

Fig. 404
(Sectional)

JENKINS BROS., LIMITED

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You Need This Book in Your Business

It will appeal especially to the man controlling a repair business. It will be equally useful to those in charge of buildings. Its table of contents gives some idea of its great scope, no less than 26 subjects being mentioned. Here are some of them:



The matter of taking up the repair of the appliance most commonly out of order, the Kitchen Sink; The Service Pipe, methods of freezing for repair work, etc.; Fuller Bibbs are touched on, as are also leaky Waste Connections; a clear and concise description is given of the action of Flushometers.

It will not permit us enumerating further the many questions, etc., which are treated very fully in this extremely practical and concise book. Price 50c postpaid.

We also have technical books on practically every subject pertaining to the heating, lighting, ventilation and sheet metal trades. Write us for list

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**I'M
NYE
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Die
Man**



I Can't Help It, Boys,—But—

I've got to keep on tellin' it over and over—so long as there are any of you users of Pipe Dies who are not using the Nye Die, because I want you all to know about my wonderfully easy cutting die—a die that enables one man to do the work of two using the old

makes—a die that takes only half the strength others require—that saves fifty per cent. in time, labor and expense—and I want you to try it 10 days free before you buy—at my risk.

Ask your jobber for one to try. If he doesn't have one—ask me—

THE NYE TOOL AND MACHINE WORKS

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WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a Want Ad. in this paper.

PEASE IDEAL STEAM BOILERS

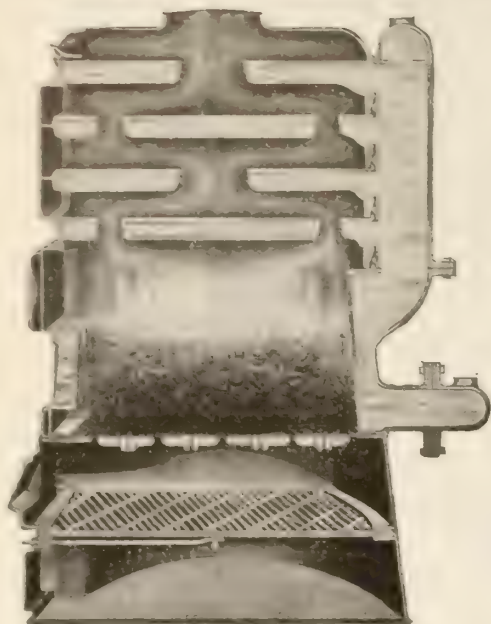
Write to-day for
Catalogue and Prices.

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Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton, Montreal

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STEEL AND RADIATION, LIMITED



Cross Section, No. 5 "King," showing Corrugated Fire Pot, Tapered Smoke Passages, Big Mouths into Water Post, Scientific Arrangement of Heating Surfaces.



"King" One-Piece Ash Pit showing Corrugated Body, Tapered Smoke Passage, Big Mouths into Water Post, Scientific Arrangement of Heating Surfaces.

Did you get one of our "New Fitters' Hand Books?" If not, ask for one. In it we illustrate and list our complete line of "King and Royal Boilers and King and Imperial Radiators," also other valuable information.

STEEL AND RADIATION, LIMITED

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Branches:

138 Craig Street, West, MONTREAL

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Showrooms:

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Agencies in all the leading Cities in Canada

You don't have to draw on your imagination—

To sell a man a "KING" Boiler.

Simply point out its many advantages, and he will be convinced.

From Ashpit to Smoke Pipe its "improved," "up to the minute," and just a lap or two on every point ahead of any competitor.

Show your prospect the "Patented" Trouble-Proof Grates of the "King" Boiler, connected without split-pins or bolts.

Let him try the "side lever shaker" and demonstrate to himself how much easier and simpler it is to operate than the old-fashioned, back-breaking "crank."

Tell him about the "double in size" mouths on the water post and their importance in quickening circulation.

Explain to him the "Corrugated" Firepot, which increases its Heating Capacity one-third, also the large combustion spaces between sections, which allows the gases to burn before going to the smoke pipe.

These and the other manifold features of the "King" Boiler are ones that make an impression on a man. A half-hour's talk on straight common-sense advantages like these will influence your prospect more than all the "oldest firm" and "longest record" pleas the other fellow can think up in a week.

King Boilers are making records and reputations for themselves and those who install them.

"King" and "Imperial" Radiators are so well and favorably known that it is only necessary to mention them.

We guarantee prompt delivery.

We carry a full and complete line of Steamfitters' and Engineers' supplies.

An Interesting Paper on Salesmanship

Read at a Meeting of the Manufacturers and Jobbers of Sanitary and Heating Goods, Which Was Held Recently.

By L. A. CORNELIUS¹ President of the Canadian Wolverine Company Ltd., Chatham, Ont.

Personal observation in our line has developed the conviction that salesmanship, as one spoke in our Commercial Wheel, has more responsibility in the making and breaking of companies than any other. This statement is made fully realizing the importance of manufacturing, credit systems, and all the other spokes that are essential, if the business wheel is to continue its revolution. This is to be a random discussion, born of certain experiences in our line, and without attempting careful phraseology.

Salesmanship may be defined as "the art of supplying the trade with its proper needs at a fair price." Assuming this, it is something more than simply the functions exercised by the group of men who come in direct contact with the trade. It must emanate from the man, or men at the top; it must be found in the talks and correspondence of not only the sales department, but also in the buying, credit, advertising and other departments. The management and the office adjuncts are absolutely responsible for the creation of an atmosphere in which real salesmanship may thrive; and the men on the road—always sensitive and alive to conditions as they find them—usually reflect the methods as adopted or allowed by the house.

Without enlarging further as to the important role which must be played by the office, but, rather, leaving it as a matter of natural deduction, we will turn to the more generally accepted use of the term "salesmanship"; as applied to the work of our travellers: The rock bottom basis is simply Simon-pure honesty—among its assets should be found: A pleasing personality, judgment of human nature, knowledge of customers' true needs, and a thorough comprehension of what portion the company represented is in the best position to supply. A technical knowledge of all details as to use and installation is particularly valuable, and the so-called salesman, who but commits the names, figure numbers and prices to memory, has still a climb before he reaches real salesmanship.

The able salesman will never speak a competitor's name if he can avoid it—it advertises: will never "knock" under any conditions; but, will post himself on the goods, prices and methods of competitors that he may know their strong and weak points, and thereby better exploit his own line. A kicker—if the term is applied to the men who report all mistakes of the house or faults in ma-

terial—is really to be commended, for he places his company in a position to improve, and the consistent "kicker" must never be confused with the despicable type termed "knocker."

Rules and forms for approaching buyers, fixed methods of repartee, etc., fall short of their purpose. To "land" requires cleverness without guile; energetic enthusiasm without misrepresentation; back-bone and perseverance without being a bore. Salesmen properly enough, give much attention as to what they should say, and they would do well to consider also the many things which should be left unsaid.

A neat business suit, clean collar, and clean shave may not be indicative of clean methods; but a thrifty, well-groomed, but modest appearance creates at once a favorable impression. We expect the "Rag and Junk" man to have dirty hands and rough clothing, and we expect a neat business attire for the man who claims to represent a good house and good goods.

Uniform courtesy under all conditions is essential, but it is unnecessary and undesirable to attempt the securing of special favor by fawning, flattering, or the entire submergence of ones' personality. The salesman whose politics, religion, or any other conviction vacillates to coincide with the buyers is building upon sand and forming a habit which destroys confidence and, therefore, trade.

Speaking of politics, etc., brings us to another point. Present day methods do not include time for the comment on, or discussion of, matters outside of the business in hand. The old, time-honored custom of commenting on the fine appearance of a store—caused, for instance, by fresh paint; inquiring about members of the family; comments on the hotel, etc., has passed and is uncalled for, except on very rare occasions. Consideration for your customer's time, as well as your own, compels the exclusion of extraneous matter. To use a homely expression, "Getting down to brass tacks" and "brevity without haste," is usually appreciated.

The reasoning, regarding special consideration for a buyer's time, might readily bring forth caustic comments from salesmen as to the treatment often received; namely, engagements, broken without excuse, hours of waiting, sudden leaving of buyer for some trivial matter, etc., but let us reflect as to the

"why" of the wains and habits of buyers.

The thousands of commercial travelers representing every line of human endeavor and touching every hamlet as well as metropolis in our land, are one of the greatest, and probably the greatest force in commercial education. If it is the habit of the salesman to invite the customer to have a drink, some will accept; if his coming to town is the signal for a "night out," he will find company; if he educates the customer to ignore the time for which his company pays him, and to keep him waiting; or to treat him as if the placing of an order was a special and personal favor, who is to blame?

Custom and public opinion are powerful forces, and, happily, let us note that a great change has taken place—and is taking place—as to the kind of education that the salesman of to-day is inculcating, as compared with the generally accepted methods of the past; nor should the salesman of the present be too impatient with the harmful, wasteful and impotent methods promulgated by their predecessors, and, unfortunately, some few of their co-workers, but, instead—with due consideration of things as they are—bend with earnest energy to produce a better condition.

I quote from a recent edition of "Mill Supplies" a few verses which are pertinent.

The Salesman.

It's twenty years or more since I began the selling game,
The methods then in vogue, and those to-day
aren't quite the same;
For we are all good fellows, and the orders
that we took
Were gotten by expense we labelled "sundries" on the book.

I worked for Steel & Millwright, selling pulleys, shafts and collars.
And every time I struck a lead I turned it into dollars;
I wasn't much on argument, but where I had my pull
Was my art of telling stories when the boys and I were full.

I made my route half-yearly, and the boys along the line
Knew there would be a blow-out, with a quart or two of wine;
And so they saved their orders so they wouldn't miss the fun,
And jags were pretty frequent till my selling trip was done.

But now the buyers take more stock in what you have to sell,
Than they do in shady stories and your ways of raising h—l;
They want to know just why your goods are better than the rest.
They ask a thousand questions, and they want to see a test.

The ruse of entertainment doesn't go with them to-day,
They're getting strong for quality, regardless what they pay;
The salesman now who makes the route has got to use his head,
In selling what he sells, and not in boozing till he's dead.

Salesmanship is much more than courteous consideration for the buyer, and the offering of certain merchandise. It embraces rational perseverance, or stick-to-it-iveness. The buyer's "No" has been the preface of many a good order, when the salesman had faith in his project and faith in himself.

We often speak of a man as "representing a certain house." We would do well to bear in mind that salesmanship is broad, and that the man who would reap the largest measure of success must also represent his customer with the same fidelity and care that he does his employer; thereby, he will deserve—and, therefore, eventually secure—the confidence of both. The largest, the steadiest, and the most reliable business is based on, and conducted through confidence. Confidence is one of the predecessors of good-will, and it is generally conceded that there is no asset that yields as much in proportion to cost as genuine "good-will." Some try to condone a customer and purchase good-will for themselves by allowing claims, practically, upon demand; without definitely determining the facts. No man engenders real lasting good-will by being an "easy mark." The salesman in all fairness must always take the stand that his house is right, until proven wrong, but when "shown," he will then champion his customer's case.

Cheerfulness is a quality that must not be overlooked. Every "Knight of the Grip" has his fat and lean days; good and poor hotels; timely and late trains, etc., but, irrespective of personal inconvenience or unsatisfactory business, he will bury his sorrows (not drown them) and strike a note of cheerful optimism, would he achieve the best results. Orders have been placed as a result of hard luck stories, but it is a system that tapers down to nothing.

Speaking of luck, it is a vaporous something of at least the five hundredth attenuation, upon which the centuries have unloaded circumstances arising from the natural law of "cause and effect."

We will now mention some negative virtues, or hindrances to salesmanship: The jokes of the minstrels; the stories in the funny papers, and a certain amount of tradition, ascribe to the salesman the character of a "Foxy Quiller."

With the young men, who recruit the ranks, the idea sometimes exists that it is creditable and praiseworthy to get the best of a customer by sharp practice. "Order stuffers" belong in this class. Then there is a variety which may be termed "One-trip-men"—they make a splendid start, get real orders, and the sales manager congratulates himself upon securing a star—but, the second trip is a thin one, and the third trip is a frost;

caused in most cases by misrepresenting proportion to his sales. In a large measure, therefore, the man with a padded expense account is fooling himself and expending money that he might just as well draw in salary. From this standpoint, commission and salaried men are practically on the same basis as to expenses.

We now pass to a less dangerous, but equally unprofitable man: The "order taker"—he has a fine appearance, good habits, knows his line, etc., but he simply asks the fatal question: "Is there anything you need?" As a rule, the buyer says "No" and the salesman retires minus business and plus lost opportunity.

Then, among types of salesmen can be found "Mr. Goodfellow" and "Mr. Tightwad," the two extremes of what should be a sensible average. "Mr. Goodfellow" earns his reputation at the expense account of his company; he also loses time, energy and health. His friends are thick in prosperity and thin in adversity. "Mr. Tightwad" doesn't buy a Sunday paper because it is five times the cost of Saturday's—therefore, he is not well informed; will carry a case seven blocks rather than part with carfare—therefore, hot and tired, and not in the best condition to talk business; stops at a cheap hotel, thereby incurring indigestion and conveying a cheap impression to the trade.

Happy and successful is the well balanced salesman who persistently treads the middle path; who, if he smokes, will share his brand with a friend, and who can accept a cigar from a customer as gracefully as he can offer one. Treating, as a business method, is a cheap, unwarranted and rapidly disappearing form of bribery.

Salary vs. Commission.

It is a current opinion that the man on salary may expand his expense account, as far as his conscience and the house will allow; while the commission man will be conservative because he is spending his own earnings.

With modern methods in a sales department, this is a fallacy. Each week, month and year the office has tabulated records of each man's sales. The total commission divided by the gross sales shows the percentage cost of the commission man. With the man on salary and expenses a similar accounting is made, and the percentage of sales cost is determined by adding the salary and expense account and dividing this total by the sales. At a glance the sales manager has a comparative cost between his commissioned and salaried men and a basis for raising salaries, if warranted, or dropping men who are unprofitable.

Further, as salary and expense are added together, to determine percentage of sales-cost, and there is of necessity a fixed limit, the man who has a large expense account must either show sales in proportion, or else be held down to a limited salary so that the total is in

Price Cutting.

This subject brings up a problem in salesmanship in which the house and the salesman have equal responsibilities. Originally, the reason for cut prices was the method employed by many houses of the "Get-all-you-can" price, with a limit of so much; also, the method of, for instance: "Our price is \$1.00 with a limit of 85c if necessary," and lastly the method of "Our price is \$1.00 but meet Jones' price and get the order."

These methods lack a business-like system and place the salesman in the compromising position of "making fish out of one and flesh out of the other." With the poor example of the house before him, the salesman may fall from grace and find the easy way is to cut the price upon demand and to take the customer's word, without question as to the price "Jones" is making. It is a common fault to magnify the importance of large gross sales and overlook the vital point of profit.

Salesmanship presupposes a fair price system under which to operate. Its operation embraces the chance to present utility as well as bulk; quality as well as price, and the keeping before the prospective customer the installation cost as well as initial purchase price.

To pattern after all the methods of old and fairly successful salesmen can not always be recommended. They may succeed from natural bent and certain virtues, and in spite of certain methods, instead of on account of them. While with the salesman as with the mechanic, some men have natural inclinations and advantages, yet, as a summary, I would say that the chief essentials to success are: Honesty, knowledge and hard work.

Elbert Hubbard in his inimitable style gives us a few lines, which are apropos:

I believe in the stuff I am handing out, in the firm I am working for, and in my ability to get results.

I believe that honest stuff can be passed out to honest men by honest methods.

I believe in working, not weeping; in boosting, not knocking; and in the pleasure of my job.

I believe that a man gets what he goes after; that one deed done to-day is worth two deeds to-morrow; and that no man is down and out until he has lost faith in himself.

I believe in to-day and the work I am doing, in to-morrow and the work I hope to do and in the sure reward which the future holds.

I believe in courtesy, in kindness, in generosity, in good cheer, in friendship and in honest competition.

Editor's Note.—The writer was at a lecture on salesmanship a few months ago, and during the evening the lecturer—we will call him Jones—who, by the way, was a crack salesman for one of the largest companies in Canada—related a conversation he had with another salesman who had not been able to land an order after having TRIED TO SELL his goods to the man. Jones says: "Well, Brown, how is it you have not landed an order from Robinson before now?"

"Well, I don't know, Jones. I can't for the life of me make either head or tail of Robinson. He simply will not buy. I've been TRYING TO SELL him our brand of goods for over two years, and he simply won't. I believe if I were a member of his club I could land him, but I hate that club. They're a bunch of fops, that's straight."

"Now look here, Brown, has it ever occurred to you that it is absolutely necessary to the welfare of our company that Robinson becomes one of our customers? It is necessary for several reasons. But, Brown, you've simply made a deuce of a blunder of the whole thing. Now I'm straight, Brown; the trouble is you've been TRYING TO SELL him goods instead of getting him to buy. Now listen. There are two kinds of customers in this world—those you can sell goods to and some you have to GET THEM TO BUY GOODS FROM YOU, and if you get them balled up you will not be long a salesman. There's a distinct difference trying to sell goods and trying to get a customer to buy."

Brown replied: "There may be a difference, but, Jones, I'll bet you anything you like you can't get Robinson to buy our goods."

"But, Brown, don't you see he's got to? That's the stand you must take in your own mind, and to illustrate the idea, Brown, I'm going to relate a story to you.

"One fine September day a chap took a stroll through a bush. He had his dog with him. Suddenly his dog unearthed a beaver. Well, you should have seen that beaver run. It ran like the mischief and the dog after it. They both ran. First the beaver was ahead, then the dog would gain on it. They ran faster and faster. All at once they came to a stream. In the beaver jumped, swam across. The dog did the same, but lost a little. However, they both ran and ran, when somehow the beaver began to loose ground steadily, and just as the dog was about to grab the beaver

it ran up a tree out of reach of the dog."

Brown laughed and said: "Say, Jones, that's an awful lie. Beavers don't run up trees."

"No, I know that, Brown, but this one simply had to. Don't you see the point?"

The very next day Jones landed an order from Robinson. He got him to buy. So, by way of a little advice to you salesmen, never try to sell, but always get your prospective customer to buy.

TRADE NOTES.

SANITARY INSPECTORS CHOOSE WINNIPEG.

At a recent meeting of the Sanitary Inspectors' Association of Western Canada it was decided that the headquarters of the new association should be in Winnipeg. The first annual meeting of this association was held in Regina, on Sept. 19. The association was only formed on April 19 and now boasts a membership of about 100. Hon. George Langley, Minister of Municipal Affairs, welcomed the delegates to Regina. The meetings were held in the parliament buildings, and were very enthusiastic.

The following officers were elected: Patron, H.R.H. the Duke of Connaught; vice-patron, Lord Stratheona; president, E. W. J. Hague, assistant chief health inspector, Winnipeg; vice-president for Manitoba, P. B. Tustin, chief food inspector; Western Ontario, W. E. Stanley, chief health inspector, Fort William; Saskatchewan, Thos. Watson, provincial health inspector, Saskatchewan; Alberta, J. J. Dun, chief sanitary inspector; British Columbia, F. L. Glover, chief sanitary inspector, Kamloops, B.C.; secretary-treasurer, Alex. Officer, tene-ment inspector, Winnipeg.

The association embraces the entire West from Lake Superior district to the Pacific. The purpose of the association is that members may meet to discuss questions of sanitation and hygiene, and such other matters as come within the scope of the work of health officers. The forms of accomplishing the end of more thoroughly equipping members for their work are by means of papers, lectures, classes, demonstration, and the publication of a magazine.

CONDEMNNS OLD LUMBER.

Kamloops, B.C., is to be complimented at having a man of ideas and sound judgment in F. L. Glover as their health and plumbing inspector.

In his report to the Health Committee he brought to their attention a matter

which cannot be too strongly condemned, and that is, the use of lumber taken from old and unsanitary buildings for re-construction work.

ONTARIO'S PROBLEM, TREATING SEWAGE.

English and German Systems Would Not Prove Adequate.

That the great sewage disposal systems of England and Germany, far in advance as they are of systems here, do not supply a perfect model to enable the Provincial Health authorities to solve the problem of preventing the pollution of inland waters is, in effect, the conclusion reached by Dr. J. W. S. McCullough as a result of his recent tour of inspection through the two countries in company with Dr. Hodgetts, of the Conservation Commission. Dr. McCullough is now preparing a report embracing his observations, some of which were passed onto the delegates of the Canadian Public Health convention at Regina early in the week.

According to Dr. McCullough the English and German systems are not nearly so thorough in their treatment of sewage as will be necessary here to absolutely put an end to contamination. These systems are assisted by the ocean tides that carry the partly treated effluent away, an advantage that is not enjoyed by municipalities along the lakes.

The great systems at Birmingham and in the Emscher district, Germany, gave the health officials many pointers, however, the most striking thing about the Emscher district being its perfect organization controlling the sewage systems of a group of municipalities under a Board of Management. Manufacturers in this district are not required to treat their sewage, but they are prevented from turning any heavy rush into the sedimentation beds.

The Provincial Officer of Health returned from Regina yesterday and reports that the Health Congress there was a splendid success, two hundred delegates from all parts of the Dominion being in attendance. Dr. McCullough incorporated in his presidential address some of the information that will form part of his report.

Okotoks, Alberta.—F. Campbell has gone into partnership with W. J. Thompson and the firm will run an up to date plumbing and tin-smithing establishment. They will handle furnaces, gas stoves, etc. Both gentlemen are well known and should do a good business in this district.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

PRINTED BY
Macpubco, Toronto Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorrinan, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, OCTOBER 15, 1913

THE SANITARY ENGINEER AND SALESMANSHIP.

IN this issue we have two contributions on Salesmanship. Hence our taking the subject up in an editorial manner.

Now do those in the craft realize that those important elements which go to make up a successful salesman should be embodied in the make-up of a successful sanitary and heating engineer? The salesman has goods to dispose of. He must have faith in his goods, and in the company he represents, and most of all in himself. He must be courteous to his prospective customer and, quoting one of the articles found on another page of this issue, he must be able to distinguish the difference between the customer he "can sell goods to" and the one he "must get to buy his goods." He must in some way make it plain to his customer that he is interested in that customer's business.

Now suppose the sanitary and heating engineer were to place himself in the same position as a salesman. He has "Goods to Sell" if he is a merchant at all and keeps a store. He has goods to sell if he does not have a store. "his brains and knowledge." He must have faith in himself, he must have faith in his calling, and, the responsibility he owes to humanity, to himself and his competitors. Now let us divide this subject and place it under five headings:

First—If he has goods to sell:

He must keep up a showroom. It must be in a good locality, not necessarily on a business thoroughfare, as in many a case it has been proved that the establishment of a sanitary and heating engineer should be nearer to a residential district than otherwise. Just as in the case of the medical profession.

This establishment should cater to the wants of the public and bear its own expenses, and just as soon as this showroom, shall we call it, becomes unnecessary to the mechanical or constructional branch and the two latter departments are called upon to bear this showroom "cost of maintenance," it becomes an uncalled for overhead charge, and should be dispensed with. If the public do not patronize it sufficiently to allow it to take care of its own overhead expenses, it is a plain proof it is not wanted.

There may be several reasons. For instance, the writer has called upon many a member of the craft and found a boy in charge who could not go into the details or cost of any of the goods in stock and, therefore, could not make a sale.

Places of business have been found closed. The establishment has been in an untidy state. And this would not be conducive to drawing business. Under these conditions the expense of a showroom is nothing but a fallacy and should be discarded.

Second.—He has knowledge to sell:

This is his chief asset. He has already acquired this knowledge through years of experience, practical and theoretically. He must have had considerable study during the period of his practical experience.

This commodity he must sell for a price if he intends to make a success of his calling. This knowledge, this experience, is his only actually acquired asset. He has it. The good he buys, he has to acquire and the moment he buys he creates a liability. If he buys for cash, why then he has to give credit to cash. If on the other hand he buys on credit he has created a liability which must be met by his only real asset, his Brains or Knowledge. Hence he must of necessity turn this asset into cash to get rid of the liability whether it be to a creditor or to cash. This should prove that no estimates which require knowledge to evolve them, should be handed out free.

There should be a charge made for them and if such a decision could be unanimously arrived at by one and all, we should see less worried looks on the faces of those in the craft. We should see better ratings in Duns and Bradstreets at the end of each name. The whole trade would have a brighter outlook, and that old saying, "Britons never shall be slaves" would become real in the case of the Sanitary and Heating Engineers who up to the present day have never been anything else.

Third.—He should have faith in himself.

He should feel that anything he attempts to do will be carried out to a successful issue. If he is asked to tender on a set of plans he should feel capable in himself to do such estimating and not have to depend on others to do the planning out of the job or take off quantities, etc.

And if he does not have such knowledge, then he should by all means get right down to "hard tacks," and study, to get down to it with a will. Thus in time he will have faith in himself, and he will not be going into such work blindly as we fear too many are doing this very day.

Fourth.—He should have faith in his calling and responsibility to humanity.

He should feel that this calling which he has chosen is one which has its responsibilities. It is a calling to be proud of because of the dignified position it holds, which is so vitally essential to the progress of civilization.

To state that one is studying sanitation in all its branches is to acknowledge that one has chosen the most scientific calling it is possible to choose.

Let us look around and note for instance that if London, the Metropolis of the world, had not attended to her sanitary matters she would have shared the fate of Rome, but the plague gave London her first real lesson of the need for sanitation. How long would she exist now were she to neglect the progressive steps which are necessary? New York would not be with us long either, nor any city if they neglected the natural laws of sanitation.

The Isle of Cuba was a bed of filth and plague until she aroused herself and adopted sanitary measures, and look at her now, she is said to be one of the many desirable places which we find in that region. Sanitation is the beginning of all things at birth, in life, and in death. We could not preach or try to practice any moral code or live moral lives in unsanitary environments. In fact, the good old Book makes at least one statement which cannot be made to mean anything but what it says, and that is, "Cleanliness is next to Godliness." It means the same and what is more, where that statement is disregarded, it takes toll by death. Therefore it behooves the sanitary engineer to have faith in his calling and realize the responsibility he has taken upon himself. Then last, but not least, he must remember his responsibility to himself and his competitors.

Responsibility to himself lies in the fact that he must see that he is taking or laying aside enough remuneration for services he puts into his business. He must realize the fact that he is working to develop a business, and that he must reserve a proper portion of face value for services which he puts into that business, else he had better be employed in the developing of someone else's business which has to provide his salary.

How many are there to-day in business for themselves who, if they put the same energy, the same thought and interest, labored the same number of hours, but what would be receiving twice the salary they take out of their own business. They work along, and do not take half that amount out of their business. They are poor salesmen. They are supplying goods to their business at half cost. In very fact, their business owns them, and not they their business. They become slaves in every sense of the word to the business. Then comes along their responsibility to other members of the craft.

Each man when he starts in business enters into part

nership as it were into the business of the locality in which others are already engaged.

He needs to see that his actions or methods of business shall cast no reflections on his brother businessman. He should join the association and learn of the ways and means set forth which others have found necessary to conduct a successful business. He should be frank and honest to himself, and by so doing, be honest to his fellow-craftsmen. He would earn their respect and as a result, enjoy their confidence as a whole. It is a true saying that one may deceive his neighbor once or twice and never be found out. But a man may go on deceiving himself and finally have to give it up at the end of a life lost. Whereas had he been honest to himself the result would have been altogether different. A man cannot be honest to himself and dishonest to his neighbor. The writer once had a statement made to him by a traveler that "he did not think at the bottom of his heart that the goods he was selling were as good as they ought to be for the price," and on account he felt conscience-stricken when trying to dispose of them. He asked what stand he should take under such circumstances.

The writer advised him by all means to quit the job. He was receiving honest dollars and cents and was expected to give in return his very best, and the moment he felt he could not do so, it was his plain duty to either quit or try and remedy matters by reporting to his employer just how he felt and hoping things could be remedied.

It is the same with the Sanitary Engineer in business. If he cannot do business both with the public honestly as well as along with his competitor, it is up to him to strain every nerve by joining his association, keeping everlastingly at it, with a view to getting matters put on a good sound basis, and by leading a good example in his own business, knowing full well that example is better than precept and that in the end right will win out and also that it is a duty to be honest to oneself in every way, thereby fulfilling a responsibility to one's competitor.

The embodying of such principles will result in the sanitary and heating engineers being better salesmen in their line, better citizens and as a whole more worthy of the calling they have chosen.



EDITORIAL COMMENTS.

Our universities are paying more attention to the studies on Sanitation and Sanitary Engineering. This should instil a new spirit into our present sanitary engineers and cause them to consider this field as a future professional occupation for their sons.

How many members of the craft are there who, while thoroughly convinced that their title should be "Sanitary and Heating Engineers," have yet failed to change their sign on their windows or over the entrance of their places of business?

It is well said that "Charity Begins at Home." Sanitary Engineering, too, should begin at home. Those of us who believe in the best methods in installation should not be satisfied to put any old cheap job into our places of business.



"Mr. Kirkwood felt that he was not authorized to give the guarantee covering the vitreous fixtures you have decided to favor us with. We will be glad to mail you a guarantee over our corporate seal if you wish that formality."

Story of a Salesman with Two Strings to his Bow

BY DANIEL LOUIS HANSON. ILLUSTRATED BY CHARLES D. MITCHELL

Showing How Jno. Kirkwood Fell Down as a Salesman by Not Taking His Father's Last Bit of Advice.

WHEN John Kirkwood, master gas and steam fitter, closed his earthly career in one of the little lake-washed Wisconsin cities, he left to his twenty-four-year old son, Joseph, a lot of live liabilities, a miscellaneous collection of dead assets and one bit of good advice:

"Make a quick clean-up of what you can get for the stock. Then go to Chicago, get a job as plumbing salesman and stick to it."

Joseph turned over the books to his father's creditors, therefore, filled two freight cars with the old stock and shipped them to the jobbers from whom the material had originally come. Then, with his tool bag in the bottom of his trunk, he started for the western metropolis.

John Renwick, sales manager of Moses Irons and Company, came back from his two months' trip abroad to find Kirkwood working the North Side and Moses Irons ready to expatiate on his great find:

"A perfect jewel of a fellow—he has worked with the tools ever since he was knee-high! The high-stein Germans along Lincoln Park can't put anything over on him. Brecker out on North Avenue, for instance. He wasn't posted on the new stack work with P and W

fittings, until Kirkwood put him next. He can give just what the slap-dash city plumber needs—a little good advice—"

"Yes, but we want salesmen and not advisers to the trade," said Renwick, who, already, could see trouble ahead.

"That is just what I am saying—here is a chap who can give advice and take an order as his fee. Kirkwood booked six inverted U, left-hand cross overs—"

"Something we have never carried in stock. They are not a practical fitting, Mr. Irons."

"I noticed that they were ringed 'short,' so I had them picked up. Brecker is too good a man to spring a shortage on just when we get him on our books. I also ordered up a couple of dozen from Cleveland. Yes, practical men who know the difference between a lockout and a flange union are what we need—" And Mr. Irons walked away with a noticeable stilt in his gait.

Renwick turned to his stenographer:

"Telegram to Senn Foundry Company, Cleveland—please," he said. "Cancel order for left-hand crossovers." Look up the purchase number, Miss Hall, and insert it. Get the message off immediately."

Late that afternoon Renwick had his first view of the newly discovered paragon. It was but a fleeting view, however, for the young man passed through the office on a dog trot, with every in-

dication of being behind his schedule. Behind him was left a trail of catalogues, price lists and half-read correspondence; each desk he had visited bore a souvenir. Kirkwood was the personification of unharnessed energy.

In the month that followed Renwick had time for but the briefest conversations with the latest recruit to the sales force—chiefly inquiries and directions. When the time allowed for an interview with Kirkwood, Mr. Renwick had not only fortified himself with a careful analysis of the new man's orders from the first day, but had also posted himself on the results gotten from the North Side under previous salesmen.

"Mr. Irons tells me that you worked hard while I was away, Mr. Kirkwood," he began genially. "And certainly you have been hustling during the last thirty days. I know the trade likes you. Now why are we not getting more business from the Lincoln Park district?"

"I work hard, Mr. Renwick, and seldom leave a shop without getting something out of it. I have taken an average of ten orders a day—"

"True enough. Your orders run high in numbers, but the total is small as to amount. We are paying you a hundred a month. Incidentals amount to another fifty. Yet the total of your business for August was only four thousand dollars. If we were selling jewelry, that might be

a good showing, but plumbing goods are sold on a ticklish small margin. So you see, my boy, that you owe us money at the end of each month."

"Competition is pretty keen, Mr. Renwick."

"But it is all local, Kirkwood. Ten jobbers visit your trade. No one of them has the advantage in freight; we are all on one footing in that respect. And we are alike when it comes to the question of patronizing home industries. Now twice that number called on your father in Manitowoc. Chicago, Cleveland, and even Buffalo sold him goods."

Kirkwood was silent.

"What wages did you get while working for your father?"

"Two seventy-five for eight hours."

"And we are paying you practically four dollars. Well, Kirkwood, you are working for too low a figure—that is too low for us. We can't afford to keep a twelve-hundred-dollar man in our best city territory. I must find one who is worth as much again to himself and twice as much in sales to us. I believe I have one in view now—"

Renwick paces through his diary, while Kirkwood's spirits rapidly slid down toward the zero point.

"And that man's name is Joseph Kirkwood. Kirkwood, your sales from now on must show a sufficient increase to justify us in paying you at the rate of eighteen hundred a year. But you can't stop at that either. Within twelve months, you must qualify in the twenty-five hundred-dollar class, or else we shall conclude that we have made a mistake."

"I don't believe, sir—"

"Wait till I get through. Eighteen hundred in salary means sales of seventy-five thousand a year. And twenty-five hundred salary calls for one hundred thousand in sales. Now, you can't boost your sales even to seventy-five thousand by sticking to staples on which there is no profit. You must sell more specialties. And that means you must get next to architects—and at times to owners."

"That will mean fewer calls on the trade and fewer orders every day, Mr. Renwick."

"Yes, it means your transfer from the class of peddlers to that of salesmen. You will plow deep instead of simply scratching the surface. You will move more slowly and think faster. You will see transactions from our viewpoint instead of exclusively from the customer's. When he tells his tale of woe you will give him enough sympathy to keep him patient while you make out a case in behalf of our house."

"That assumes, of course, that you must believe, first of all, in us and in the goods you sell. From that will come a

belief in yourself which will vitalize your energy as a salesman. You climbed out of one rut in Manitowoc, only to fall into another quite as deep in Chicago. And a rut, you know, is just as deep as a grave. From now on, you will have to use up less shoe leather, Kirkwood, and more grey brain matter."

Park Mansions on "the Drive" had reached the second story in its process of construction. John Speke, its owner, was still in deep doubt as to the line of plumbing fixtures and heating apparatus he should install. Park Mansions was the most pretentious apartment structure west of New York City, and consequently a most delectable morsel for material men. So much so that Speke's life was none the happier because of his indecision. In fact, each passing day added to the young millionaire's burden. Salesmen came out from behind trees when he passed through the gates of a morning. They shared his seat in the car. They invaded his clubs. They fought for precedence at his office.

Still Speke hesitated between enamelled fittings and vitreous porcelain. Nor could he decide upon plain radiator in preference to ornamental—or vice versa.

"If I could only disassociate the baths, lavatories and kitchen sinks from the personalities of the salesmen selling them I could quickly decide," he confided to his secretary. "But when I see that vitreous wall tub I can't help remember the salesman with the red nose and tan waistcoat. While, on the other hand, the iron tub on a flush base is reminiscent of the tall chap with the white lawn tie."

The secretary laughed.

"I like the porcelain corner tub with the recessed shower," he suggested.

"So do I, but that brings to memory the lightning salesman from Moses Irons and Company, who is shot at me ever few days by a catapult. He rattles off a dozen rapid-fire questions as to what I have decided to do and is then, as suddenly, snatched from my view. He demonstrates that motion is quicker than sight—his motion and my sight. I always get a headache after he has been here."

With a chuckle at the dilemma his memory had evoked, Mr. Speke continued:

"Wendell Phillips should have devoted that lecture of his, 'Lost Arts,' to salesmanship. Possibly it has been lost since his day, though. I shall simply force that order on some one. But I have a soft spot for that old granite block, Moses Irons, so I'll send for that lightning salesman of his and compel him to take it. It is time the stacks were in the building."

It transpired at two o'clock of the same day, therefore, that Mr. Speke sprung the inner bolt on his office door,

saying at the time with an apologetic smile to Mr. Kirkwood:

"This will hinder us from being disturbed. I really must come to some definite settlement as to the plumbing and heating fixtures—the building is waiting for stacks and risers."

Kirkwood was locked in with a buyer. There was not a chance in a thousand of his losing. Yet he was ill at ease!

"I find that there is some difference of opinion as to the durability of this so-called vitreous ware, Mr. Kirkwood, and if I select that it will have to be backed up by a strong guarantee. Are your people prepared to guarantee it?"

Now there should not have been any doubt in the mind of Kirkwood, or of any other salesman of Moses Irons and Company as to the guarantee on this particular material. Renwick had been forcible in the matter, the ironmaster, himself, had asseverated in voluminous letters that it was warranted against crazing and acid tests. While back of these two stood a huge organization of potters.

But Kirkwood, face to face with a fifty-thousand dollar order, hesitated.

"Yes," he said after a pause which could not but chill even the most enthusiastic buyer—"Yes, we will guarantee the stuff. It is good stuff; you can't beat it."

Clearly Mr. Speke was disappointed—he had expected the salesman to make the way of placing the order easy for him. He took another tack:

"Can you make prompt delivery—that, is, within one month from date if we need the stuff?"

Now Kirkwood knew that it would be three months before finishing goods could be installed. At present roughing material was all that would be called for. Yet again he took the wrong course.

"We can make delivery on lavatories and closets in a week, and can give you the rest of the fixtures in a month."

Mr. Speke looked at him doubtfully.

"I understand that only the samples were in stock, and that the kiln process was a matter of three weeks."

All of which was true, as Kirkwood knew. It seemed to him that he could not modify his words, and tact to work out of the dilemma deserted him.

Speke, who read character shrewdly, felt a twinge of pity for him:

"How long have you been with Moses Irons & Company, Mr. Kirkwood?"

This question opened still another way by which the salesman might have saved the day. The inquiry showed that Speke felt a personal interest in him. It would have been only a step to turn that interest to his own advantage by throwing himself on Speke's mercy and soliciting the order as a necessity to himself; but the mania for moving on—of seeing the

next customer—had him in its firm grasp:

"Since June. I am sorry that I can't book the order. I will not take any more of your time." He stood at the door waiting for Mr. Speke to unbolt it.

While the owner of Park Mansions sat and ruminated on his inability to place the order for fixtures, Kirkwood sought out the nearest telephone booth and unburdened his heart to Mr. Renwick:

"I have fallen down good and hard, and it was all my own fault. He tried to give me an order, but I lost my head." Followed a detailed account of what had transpired behind the locked

fixtures. The roughing goods we can begin unloading to-morrow morning. If you will give me a line to your plumber, we will make up a list for him this very evening?"

"Of course I will. You are the first to show any intelligence about this order: the rest have sort of skated around it."

Before Renwick left the office of Mr. Speke he had a signed contract for radiation and boilers, which no contractor would venture to question.

Mr. Renwick's conference with his dejected salesman was sympathetic.

"This idea of resigning is all your

ter chance to take that order. He actually threw it my head and I dodged it. A fifty thousand dollar order, and I dodged it!"

"Well, you have had the experience," the other counseled, "and we have the order. So there's no great harm done; your telephoning saved the situation. Next time you'll do better."

"No, sir, I wouldn't, or couldn't, which is the same thing when it comes to results."

"What are your plans, then?"

"I am going back to Manitowoc to work with the tools. There is a union up there now, and wages are up to three-fifty a day for eight hours. If I have to be in a rut I prefer a country rut with a clear blue sky overhead. That is all one can see from a rut anyway, you know."

"Why don't you go into business for yourself, Kirkwood?"

"Sure thing; that is just the programme for you." It was Moses Irons who added the hearty endorsement to his sales manager's suggestion, having come in at that very moment.

"With my father's record hanging over me?"

"Your father's misfortune was his own affair," Renwick answered decisively. "No one blames you for it. He was honest, and so are you. Things have changed up there. The town is booming now; two car-factories making it their terminus, and a big new pulp mill going on. Mr. Irons will give you a line of credit, throw inquiries your way, as well as his influence on the pulp mill job (he is a stockholder), and he will stake you for a creditable show room."

"You have spoken the right word, John," said Mr. Irons approvingly.

"It is more than I deserve." The salesman choked over the words.

"Tut, tut, Kirkwood; it is only a business proposition with us. Now go out into the stockroom and pick out a first-class kit of tools for yourself. Do not fail to put them in a high-grade bag—that is with our compliments."

"Thank you, but I brought a complete set with me to Chicago. It is still in the bottom of my trunk."

"Brought a kit of tools in the bottom of your trunk, did you?" Mr. Irons rammed his hands deeper into his pockets. If I had known that you would never have been tried out as a salesman. Why, it was hopeless from the very first—you with that kit of tools to fall back on."

He looked after Kirkwood's retreating from a moment later, then shook his head gravely at John Renwick.

"My mistake, John," he admitted glomily. "I should have made inquiries about that fellow. No man who has a tool bag in his trunk will ever make a salesman. He does not have to."



Your father's misfortune was his own affair. No one blames him for it. He was honest and so are you. Things have changed up there: the town is booming now.

door. "Yes, he is there now." And Kirkwood heard Renwick hand up.

What the sales manager thought of his failure Kirkwood never learned. Nor did Kirkwood know that within three minutes from the time he emerged from the telephone booth Renwick had requested and had been granted an interview with the anxious Mr. Speke.

The conversation between the two had not been an extended one:

"Mr. Kirkwood felt that he was not authorized to give the guarantee covering the vitreous fixtures you have decided to favor us with." Mr. Speke's eyes sparkled. Here at last was a salesman. Here was a man who spent little time in wooing an order. Pen in hand, he was ready. "We will be glad to mail you a guarantee over our corporate seal, if you wish that formality. As to delivery, we will not keep you waiting for

own, Kirkwood," he declared. "I still have faith in your ultimate success. You have been experimenting and have had some sad falls. But there is still an element in you that gives me hope."

"No, sir, what I have learned during the last three months has simply shown me my limitations. I know that I am not cut out for a salesman. I have puttered away on details so long that I can't see the bigger things lying around. And for the life of me I can't see any other side of a dispute between the house and a customer than his. When some one gives me a little dinky order I am so overcome with gratitude that I forget to push for the real business."

"Your excessive gratitude will wear off in time. It always does."

"I'm afraid not, Mr. Renwick. When I think over the affair in Speke's office I feel like investing in a patent self-kicking machine. He gave me chance af-

New Sanitary and Heating Goods

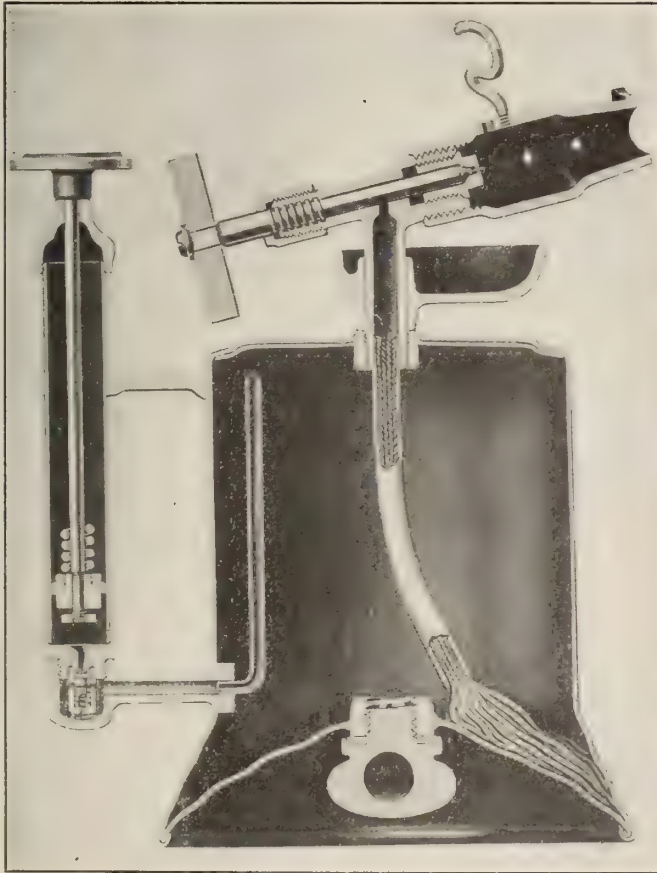
A UNIVERSAL BLOW TORCH.

A new gasoline blow torch has recently been placed on the market by the Westinghouse Electric & Mfg. Co., East Pittsburg, Pa., which embodies a number of novel features and improvements. These improvements, it is claimed, adapt the torch for all conditions of service, and it is therefore called a Universal Blow Torch. An illustration of the torch as a cross-sectional view is here shown.

The burner is made particularly heavy so that it will retain its heat and keep the torch burning in cold or windy weather, and the drip cup is made especially deep so that it will start the torch under bad weather conditions.

The handle of the valve is of fibre, and does not get hot, nor does it need a long valve stem for cooling. On the other hand, it will not crack, loosen and come off. It does not char or burn.

The tank is made of heavy gauge brass and is reinforced with an extra corrugated brass disc covering the entire inner surface of the tank pot. This insures the tank keeping its shape under very rough handling. The pump valve works in a cylindrical guide which it is claimed assures perfect seating of the valve. It can be taken apart and any part replaced separately. The illustration shows the quart size of torch. A pint size is also furnished and differs only in the shape and size of tank.



Universal Blow Torch.

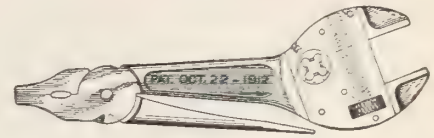
These features, however, do not detract from the use of the torch for indoor work.

Another feature of the torch is the self-cleaning burner valve. The needle at the end of the valve stem cleans the hole automatically when the valve handle is turned. The valve seat need, therefore, never be injured by picking at the opening to clean it. The valve seat is a separate replaceable plug.

COMBINATION PLIER AND WRENCH.

The Burgess-Norton Mfg. Co., Geneva, Ill., are manufacturing for the Chamerlain Wrench Co., a combination tool consisting of wrench, plier, wire cutter, pipe tongs, thread cutter and screw driver. The tool, an illustration of which is here shown is drop forged, accurately milled, case hardened with a mottled finish. It is claimed that

the tool is compact and is not clumsy. The plier end it is claimed affords a splendid grip for the wrench while the purchase or leverage supplied by the wrench itself gives the operator a handhold in using the other end as a plier,



wire cutter or pipe tongs. Another feature emphasized by the manufacturers is the manner in which the die seat is placed. Instead of being placed directly in the end, the die seat is placed nearer the centre of balance. This it is claimed enables the operator to use both hands and assures true even threads. Button dies are supplied in three sizes: $\frac{1}{4}$, 5-16, $\frac{3}{8}$. The adjustable jaw is very strong and each wrench is thoroughly tested before leaving the factory. The tools are packed one-half dozen in an attractive card board box and 1-3 gross in full case.



WESTERN CANADA EXAMINING BOARD.

Royal Sanitary Institute Arranges for Examinations in Winnipeg—

An examining board for Western Canada, for the Royal Sanitary Institute of London, England, has been appointed in Winnipeg as the result of a visit to Winnipeg by E. Dolymore, a member of the executive of the institute who is travelling in Canada for the purpose. The new arrangement means that examinations for qualification for the certificates of the Royal Sanitary Institute, which is the foremost institution of its kind in the British empire, can now be conducted in Winnipeg. In the past it has been necessary for candidates for certificates to write on papers sent from London by mail, and to have their papers examined in London. In future the local examining board will hold regular examinations.

The Royal Sanitary Institute has had an examining board in Montreal, at McGill University, for some time. Vancouver is to have a similar examining board in connection with the University of British Columbia at an early date.

The examining board for Winnipeg, which will have jurisdiction in Manitoba, Saskatchewan and Alberta.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



HOW TO CONNECT RETURNS.

Editor, Sanitary Engineer.—In connecting the returns on a steam heating job where one return main comes to the boiler in opposite direction to the other what method would you advise? They are dry returns I am referring to, and the sizes are 2 inches.—An Inquirer.

In answer to Inquirer, we herewith produce an illustration showing how

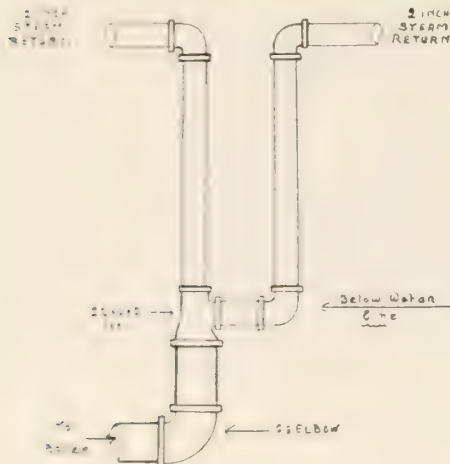


Fig. 1.

these returns should be connected. But it would be far better if the returns could enter the boiler independently of each other. However, we presume by the very nature of the question that only one inlet is available on the boiler.—Editor.

HOW TO INSTAL A BASIN.

Editor, Sanitary Engineer.—I sometimes get a chance to read your paper, but I am not in the sanitary engineering business. My occupation took me into the workshop of a sanitary engineer. I saw a wash basin put up just as I have shown in the sketch enclosed. I am sure I made no mistake, because as it happened I bought a house not long ago and there is a new w.c. and porcelain bath, but no basin. I called in a sanitary engineer to see how much it would cost me to put in a basin, and he wanted an awful price. So I asked him why, and he told me he would have to

put several fittings into the main soil pipe, and gave me the sketch I have also enclosed. He explained a fitting called a 4 in. by 2 in. tee, which was in the soil

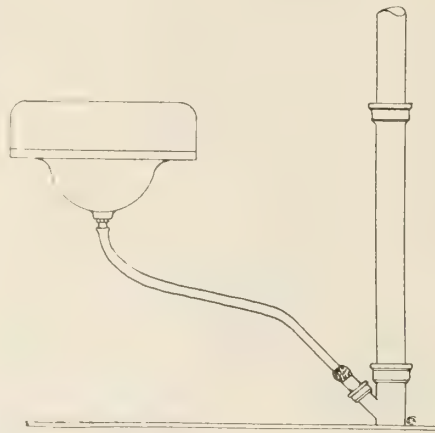


Fig. 2.

pipe, could be used, and that it had been used for a vent to a Richelieu closet, and that whoever put the new closet and bath in had not put them in

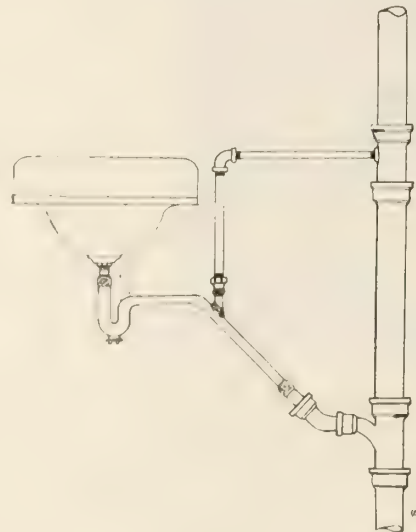


Fig. 3.

up-to-date, and a lot more stuff which I could not follow. Now, pardon my long letter, but what I do want to know is which is the only proper way for me

to have a basin put into my bathroom? Could you please tell me in a future issue of Sanitary Engineer?—Doubter.

If the first sketch mentioned is correct, and there is no trap underneath the wash basin, it is certainly wrong to have it installed in that way, and the sketch you speak of as being the one submitted to you by the sanitary engineer whom you called in is correct, we have taken the liberty to add dotted lines from the crown of the trap, which will show some of our readers the difference of back-venting practice. In conclusion, we may also add that any sanitary engineer who would either instal a basin in his workshop, or even allow one to exist, certainly has not the cause of sanitation at heart, and should be made to instal the basin properly.—Editor.

CARE OF HEATING PLANT.

Editor, Sanitary Engineer.—I am a constant reader of Sanitary Engineer, and would ask you to kindly answer the following questions relating to the operating and care of an automatic air valve steam heating plant:

First: Is it necessary to use any substance to take the scaling off the boiler flues?

Second: If so, what should be used, the quantity and how often?

Third: How much water should be kept in the boiler—H. W. G.

There are quite a number of boiler compounds for removing scale from the inside of boilers, some of which we will give our readers. Each has its own set of directions.

If the flues are dirty with soot and rust, a very good way to clean such dirt off is as follows:

Get a flue cleaner and brush all loose dirt, soot, etc. Then get a good red fire on, free from smoke or flame. Then take 1 lb. of scrap sheet zinc clipped up small to each square foot of grate area. Spread it over the fire as quickly as possible and close up soon as can be all the doors of the boiler. Allow it to burn slowly. The gases from the burning zinc will loosen all up, and you can

scrape out the flues again. You should have a clean boiler.

Regarding the amount of water which should be kept in the boiler, that depends on the kind of boiler. If a tubular boiler, the water should be kept at least high enough to cover the top row of tubes, and in the case of a round cast iron boiler the water should be over the top part of the highest section or to cover the bottom of the section which acts as the steam dome. With a square sectional boiler the water should cover the bottom of the highest fire passages. However, if the boiler is of the two last mentioned types, it would be well to write the manufacturers, as they can and will give the necessary information which applies to that particular type. Such data is always supplied willingly.

List of jobbers who sell boiler compounds:

J. M. Boiler Preservative—Sold by H. W. Johns-Manville Co., Ltd., Toronto.

Potato Scale Boiler Cleanser—Sold by C. C. Snowdon, 1810-1840 Eleventh Street East, Calgary, Alta.

Electric Boiler Compound—Sold by Electric Boiler Compound Co., Guelph, Ont.—Editor.

REMEDYING AN OLD JOB.

Editor, Sanitary Engineer.—I am sending you a sketch of some work which was installed in a house where I am making some extensions. When the fire is lit in the range the water front gets very hot, but there is absolutely no circulation to the boiler. Presumably this is the cause of the dip in the pipes. I have proposed to the owner that I would take the top pipe of the water front and run it over the door, but he is afraid it will not work. So I told him I would submit my idea to some other authority. —H. E. W.

Fig. 4 is a copy of sketch showing the job as H. E. W. found it. Now, if the man who had installed it in the first place had devoted a little more time to study he would never have executed it in that manner. He evidently had not learned that water will not circulate unless laid out in what might be termed a circular manner, and must have no resistance. Now to make this job work. Our correspondent is right in his idea, and we have produced an illustration in Fig. 5, which shows how it should be laid out.

The idea is, when the heat in the water front strikes the water it instantly heats the water, of course. In doing so, it raises the specific gravity, thus giving it, as it were, more buoyancy. The water

then rises if it can, and in doing so must be displaced by other water. The cold water in the tank, because of being heavier, fills up the position taken by the

Volumes have been printed and reprinted on this question of range boiler connections, and still it is a very interesting topic.

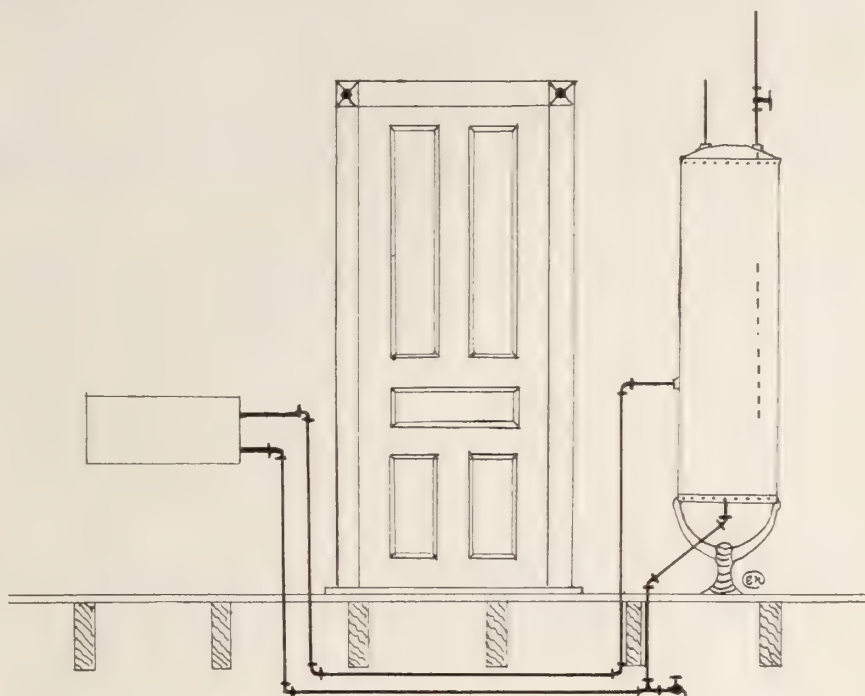


Fig. 4.

water which has been heated, and at that moment circulation is established. Providing there is no obstacle in the way, and as the only motive power which is

If Fig. 2 is followed out and the pipes are reamed, the pipes must have no pockets, and also the fewest possible number of elbows used. The job is bound

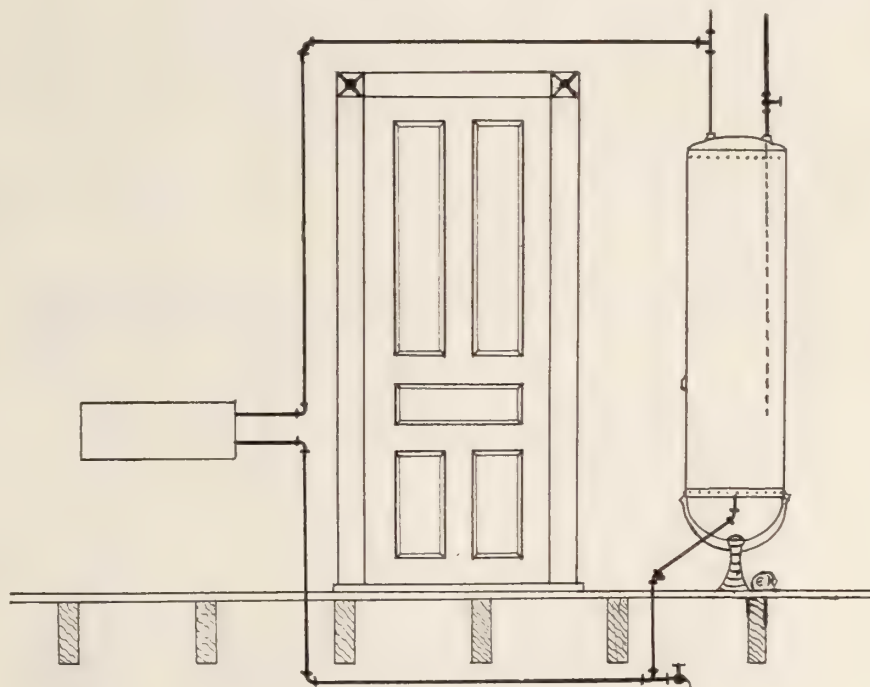


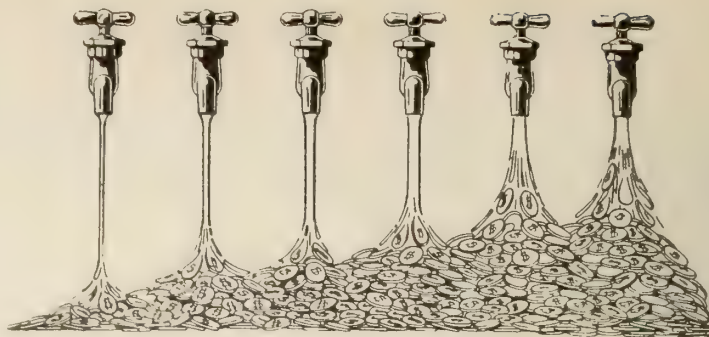
Fig. 5.

used is the difference in the specific gravity of the water caused by the heating of it, very little will be needed to prevent the circulation.

to give every satisfaction. Of course, it will take a little longer to heat the water than if the range were close to the boiler.—Editor.

LEAKS

More money having to be spent for water works purposes in Montreal. Other cities finding their plants too small. If all leaks were attended to this would be unnecessary for many a year to come. Sanitary engineers asked to cultivate a demand for better class goods, thereby reducing this uncalled for expenditure.



MONTREAL'S FILTRATION PLANT IS INSUFFICIENT.

That Montreal's new \$3,000,000 filtration plant, regarding which there has been so much discussion this summer, is not large enough, and that within twelve months at the latest another \$1,000,000 or more will have to be spent on the work in order that it may meet the requirements of the city, is a situation which officials of the city aqueduct department recently disclosed at the City Hall.

That the matter is a serious one, and one which will have to be taken up without loss of time, is evident from the statement made public regarding the city's consumption of water, and the steps which are about to be taken to increase the pumping capacity.

In our issue of September 15th an item appeared referring to the enormous cost of upkeep, etc., of public waterworks and emphasized the necessity for sanitary engineers to voice to their customers in no small way the very good reason that all leaks should be attended to. Montreal citizens are not the only people who are having to spend large sums on further extensions to their waterworks. Almost every city in Canada is laboring under the same terrific load of expense.

When we consider the amount of water a 64th of one inch will leak in 24 hours, the cost is enormous, and should be attended to.

The w.c. tank is the worst source of leaks in our homes, and such a small leak as one-sixty-fourth of an inch could scarcely be noticed, and at the average rate charge for water it would cost a matter of \$3.65 a year.

This is not the only cost. If when a leak is discovered it is attended to at once there is no danger of the seat in the valve being destroyed. But if, on the other hand, these valves are allowed to go on leaking, in a very short time the valve has to be replaced, often costing 3 to 4 dollars, besides the cost of water already wasted. Of course, the public as a whole do not see the matter in that light. Hence it is the duty of the sanitary engineer to point these facts out. Another view to be taken of

this matter is: When a customer makes a call at your store and asks you to put in a new cock or w.c. tank valve, always induce them to put a good one in; show how easy it is to add the price on a poor article in a very short time by having to repair it, and you will invariably find that your customer will take the higher priced article. They get the valve right there, and at the same time are being a party to decrease the amount of money which is having to be spent from time to time by our "city fathers" to keep up the demand, of which a large portion is for leaks.

*We are indebted to H. Mueller Mfg. Co., of Sarnia, Ontario, for these figures and illustration.

QUESTION BOX.

Editor Sanitary Engineer:—"Could you publish a typical method of twin connection for a pair of sectional steam boilers, one which could be utilized and controlled in such a way as to be able to use one boiler alternately or together at the same time keep a steady water line?"

Yours truly,
"Steam."

In Fig. A we give a very simple method of twin connection, which, of course, would only apply to this particular kind of boiler, but the position of the valves would be about the same which is the most essential feature.—Editor.

Under Average Water Rates and Pressures This is the Way That Leaks Run Into Money

Each 1-64 inch leak wastes	2 gallons per hour and costs	1c per day
Each 1-32 inch leak wastes	8 gallons per hour and costs	5c per day
Each 1-16 inch leak wastes	34 gallons per hour and costs	21c per day
Each 1-8 inch leak wastes	137 gallons per hour and costs	86c per day
Each 1-4 inch leak wastes	514 gallons per hour and costs	\$ 3.21 per day
Each 1-2 inch leak wastes	2057 gallons per hour and costs	\$12.84 per day

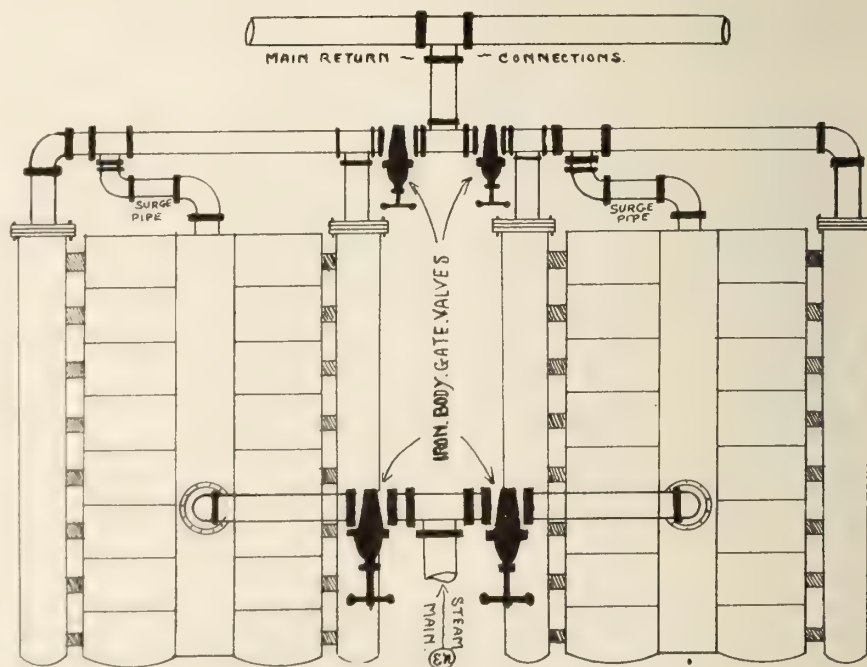


Fig. A.

A Sanitary Equipment for a Country Residence

Dealing With the General Layout of a Complete Plan of Sanitary Engineering for a Moderate Sized Residence, Taking up the Subject of Sewage Disposal Systems in a General Way.

Editor Sanitary Engineer:—"I would be very pleased if you could publish an article in your next issue on the equipping of a country residence with sanitary engineering, treating especially the disposal of sewage. This is a very interesting topic and too much cannot be said in an educative manner, hoping you can oblige.

Yours respectfully,
An Interested Reader.

THE disease spreading propensities of vaults and cesspools has received so much attention by health authorities in nearly every community that their use now in many localities is strictly forbidden. They not only endanger the health of individuals and reduce their ability to resist disease by breathing impure air resulting



Fig. 1.

from these malodorous collections of organic and vegetable refuse, but the ground around the dwelling becomes polluted and often is the source of contaminated ground water, issuing from wells or springs, at a considerable distance away.

It is an established fact that seepage from organic matter buried deep down in the ground will remain in a putrid state for an indefinite period, while if this same refuse is buried at a less distance it will be quickly broken up into its original elements and be absorbed by plant life. This is due to the action of bacteria present in shallow depths which require the presence of air to exist. These bacteria are not present in the lower depths; therefore, there is no opportunity for the seepage from vaults or cesspools to be purified.

The modern way of disposing of household waste is to first liquefy it and then distribute it over a wide area at a depth shallow enough to insure free bacterial action by these bacteria which exist close to the surface.

This is accomplished by the use of a septic tank and a system of drain tile

should not remain in the tank longer than 24 hours or it becomes over septicized and putrid and is not susceptible to further purification by the aerobic bacteria in the earth.

An automatic discharge apparatus is also important in preventing the liquid wasting from the tank before it has re-

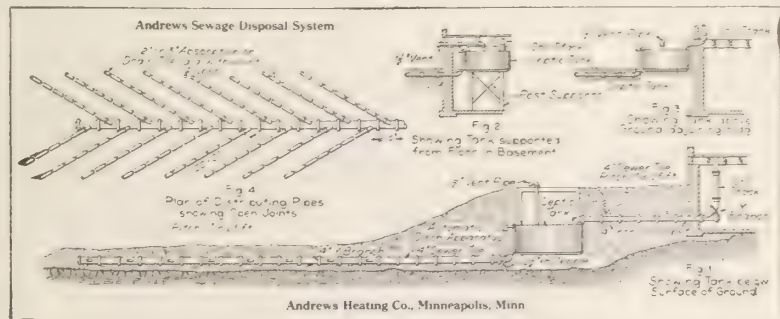


Fig. 2.

as illustrated. The sewage is acted upon in the tank by anaerobes or bacteria which live in the absence of oxygen. They decompose and reduce all organic matter to a liquid which is syphoned out of the tank and spread over the disposal field through the drain tile where it is completely purified by the aerobic bacteria living close to the surface.

To get the most satisfactory results care should be taken to design a septic tank of the proper proportions for the sewage to be treated. An automatic discharge should also be provided to empty the tank at proper intervals as the liquid

received the proper treatment which requires at least 12 hours.

Various forms of septic tanks have been in use for several years. But of late great improvements have taken place, which have increased the efficiency in no small degree. In fact, all the provincial health departments are now advocating the use of these tanks, which are of various forms.

Fig. 1 is known as the Andrews steel septic tank, and is manufactured by the Andrews Heating Co. of Minneapolis. These tanks are of heavy steel plates and riveted so as to make them both

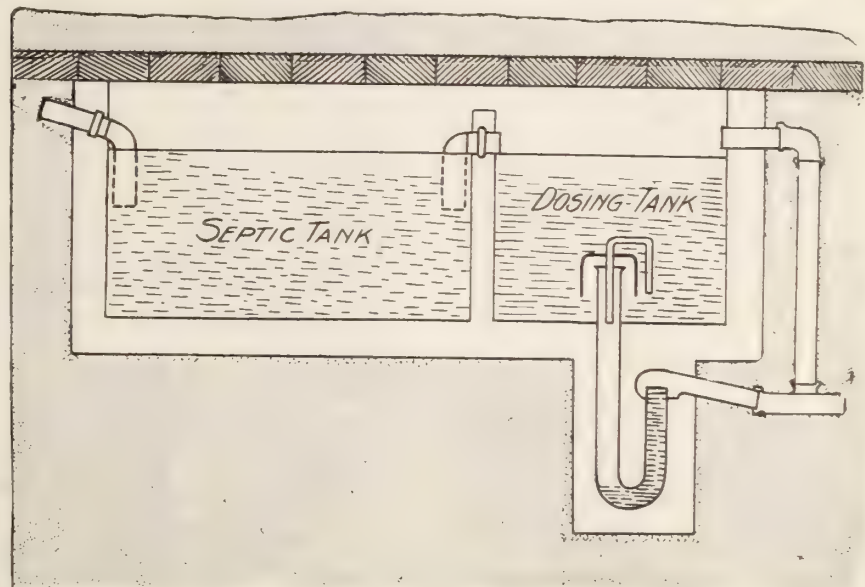


Fig. 3.

gas and water tight, and may be placed either in the basement or outside the house, either above or below the ground, according to the climatic conditions of the locality.

syphon. These are manufactured by the Pacific Flush Tank Co. of Chicago, Ill.

Fig. 4 is a similar style of tank, and is operated by a Quinn valve. This valve operates in exactly the same way as an

glazed tile shown in Fig. 5. These field tile should be laid a little open, with broken tile or stones over the joints so as to allow the sewage to seep out and prevent earth from washing in.

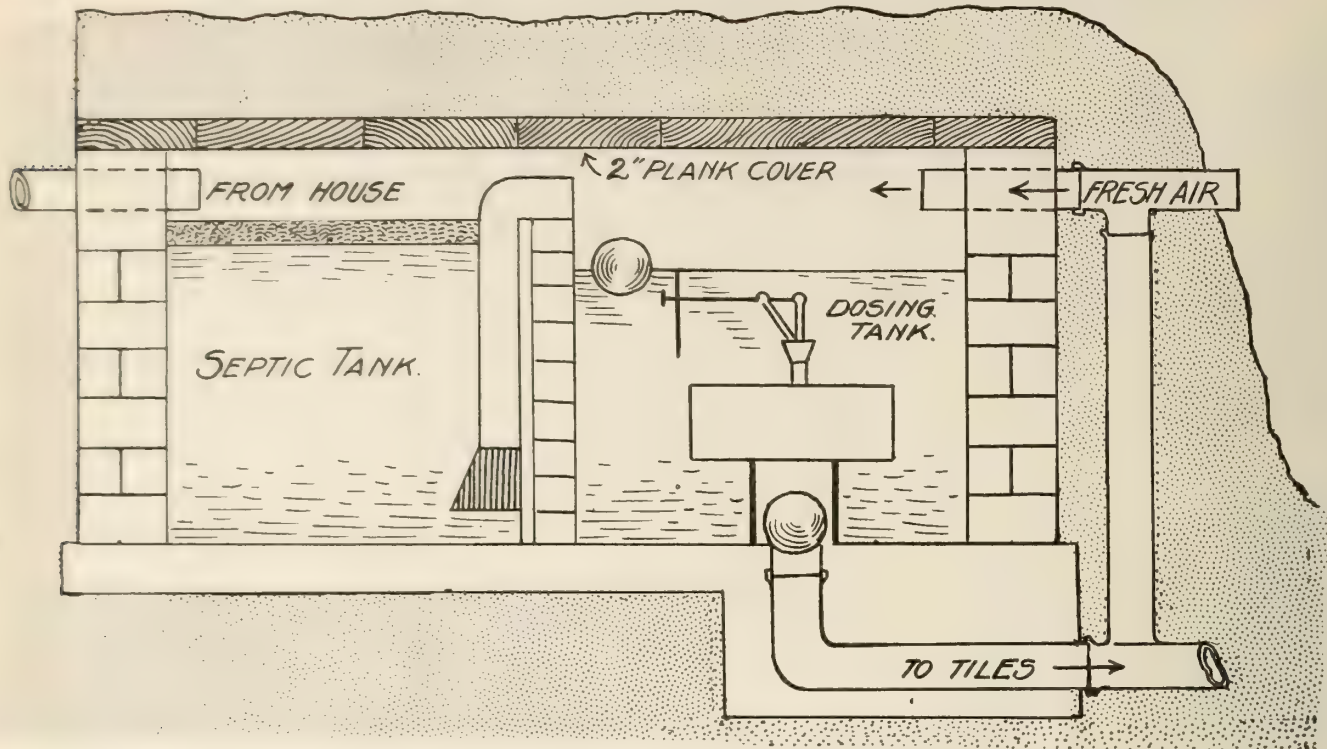


Fig. 4.

A partition divides the tank in two compartments, one of which receives the sewage and holds it until all organic matter has been dissolved, when it overflows into the discharge compartment, from which it is automatically syphoned at intervals.

This tank is proportioned so that enough liquid leaves the tank at each discharge to insure an even spread throughout the disposal field and to allow plenty of time between discharges for the liquid to filter through the earth and be purified.

The design of the disposal field depends largely on local conditions, such as the nature of the soil, slope of the ground and position of septic tank.

Fig. 2 shows a typical design for a sewage disposal field. A line of 4 inch sewer pipe extends from the septic tank, from which branches are taken with Ys, so that the flow will be free and as nearly equal as possible through all branches. These branches are made of ordinary drain tile laid with the joints open about $\frac{1}{8}$ inch.

Another feature of Andrew septic systems is that they can be erected in the cellar or basement, thus dispensing with digging. A study of Fig. 2 will show the different positions in which they can be placed.

Fig. 3 is a form of tank which can be built of brick or cement, and is operated by what is known as a Miller automatic

ordinary w.c. tank. In fact, all these tanks must of necessity operate in a similar manner because the flow of sewage must be intermittent.

As regards the size of tank necessary, a safe rule to follow is: For each person residing in a house allow 3 cubic feet area in each tank or division, and for every cubic foot in tank area allow 13 feet of field tile, in addition to the

If the earth is good, loose and of a loamy nature, a thin layer of broken stones is very good to lay the pipes on. But if, on the other hand, it is clay soil the trenches should be dug 2 feet deep and 2 feet wide, filling up to within 12 inches with coarse gas coke or broken stones about the size of an egg. See Fig. 6.

(Continued on page 24.)

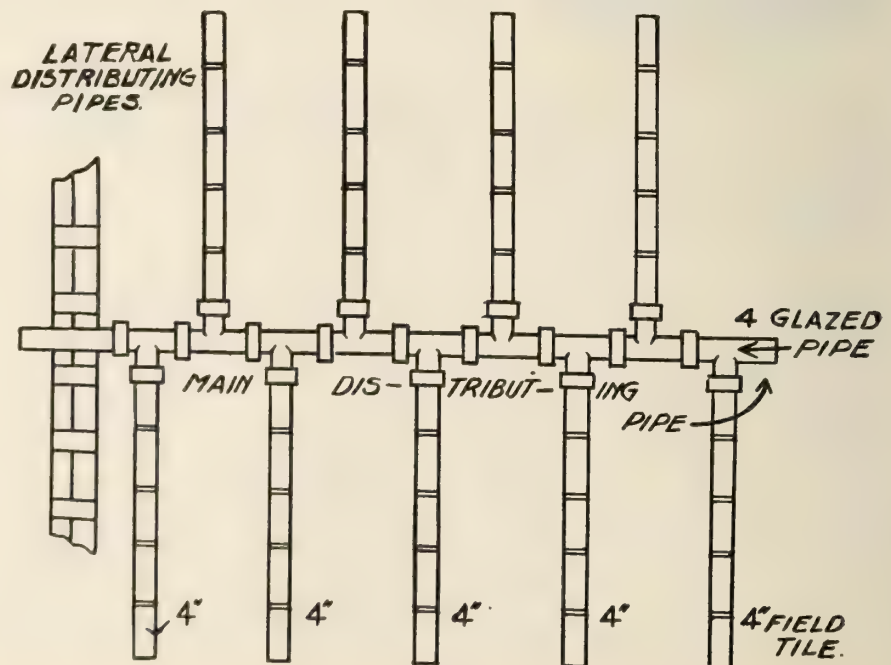


Fig. 5.

Change of Name Both of Our Craft and Canadian Paper Endorsed by "Valve World"

A Publication Issued by The Crane Company of Chicago Which
Prophesies a Change in Name of Those Engaged in the Craft
Across the Borders.

THIS change of name which has been in the lime-light from time to time and which has been a very interesting topic is not only a change in name.

It is the natural awakening of those who are engaged in the craft to a wider and greater responsibility. It should be, if it is not, a mighty inspiration for higher things, greater accomplishments, greater enthusiasm in our labors. We should view the results of our labors with pride and put more of the soul in it than has been done in the past.

It is a compliment to the craft in Canada to have our brothers across the line endorse our statements. But we must back those sentiments with real concrete accomplishments. We must feel the responsibility which is ours in a practical manner. We must co-operate. We must associate more one with another so as to become one undivided whole. We should be represented in the council chamber more than we are, and on the boards of trade. In fact, we should be more public spirited, and become more interested in civic affairs.

No craftsman, as far as general practical knowledge is concerned, could be better fitted for the council chamber than a good sound practical sanitary and heating engineer. His knowledge of things generally is of a wider scope than that of any other tradesman.

PLUMBER OR SANITARY ENGINEER?

(From the Valve World.)

Shall the man who puts the sanitary and heating equipment in our homes and other buildings continue to call himself a "plumber," or exchange that ancient title for that of "engineer?"

The trend of the times seems to be giving an unqualified affirmative answer to the second clause of the query. In the earlier years of the craft, the word "plumber"—

a worker in lead—was a comprehensive designation; but the plumber of to-day does comparatively little work in lead, and does a great deal of work with other materials and under much greater exactions than were required of his prototype.

It is significant of the newer view of the plumbing trade and business that what formerly was the National Association of Master Plumbers of Canada, now is known as the Canadian Society of Domestic Sanitary and Heating Engineers, and the name of The Plumber and Steamfitter and Sanitary Engineer of Canada, has been changed to that of The Sanitary Engineer, Plumber and Steamfitter of Canada.

It is the belief of the publication named that before many years have passed the title "Master Plumber" will have become obsolete and in its place will be found the correct designation for members of the trade—"Sanitary and Heating Engineer." As the Sanitary Engineer points out, "with the advance of civilization and the perfection of sanitary appliances, the scope of the craft has changed entirely. The sanitary worker to-day must have exhaustive practical training along lines of complex domestic engineering; and in addition, must be equipped with insight into the laws of science and physics. He must understand the natural laws governing heating, ventilating, and gravitation. In fact, he has become an engineer in every sense of the word and as such he deserves the title."

This line of reasoning appears to be sound. About all the lead there is in the plumber's craft to-day is in the first syllable of the name; but the plumber is required to do many things and to know many things properly coming within the scope of the term engineer. It is not unlikely, therefore, that the "plumber" of the United States officially soon will follow the lead of his fellowcraftsman of Canada, and with the new title make characteristic of the business and the trade the greater dignity and responsibility it carries.



A SANITARY EQUIPMENT FOR A COUNTRY RESIDENCE.

(Continued from page 22.)

The growing demand for country and suburban homes is bringing new opportunities for profitable business to the

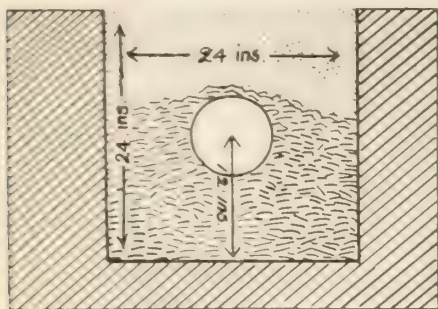


Fig. 6.

plumbing contractor, who, in order to make the most of these opportunities, should post himself especially on sewage disposal systems so as to be able to properly advise the prospective builders.



THE SEWAGE SITUATION IN PORT ARTHUR.

Until Province Adopts Permanent Policy City Cannot Plunge Into Expenditure.

Dr. McCulloch, of the provincial board of Health was in the city yesterday, and held a conference with Mayor Oliver, Alderman Campbell and City Engineer Jones at the engineer's office. The discussion was on the proposed plans for the disposal of sewage, and the medical man, while in some doubt apparently of the plans meeting with his unqualified approval suggested that they be prepared along the lines proposed and then any changes deemed advisable made upon their submission to his board.

The undertaking of disposing of the sewage is going to involve an expenditure of upwards of a million dollars and will consume possibly five years time. Until the plan is adopted by the provincial board it will be impossible for the city to carry out any extensive sewerage work as pipe laid without the sanction of the board may be ordered up or abandoned. Under these circumstances the council hesitates undertaking more than the very smallest necessary work.

The city engineer's office is engaged in drafting the plans for the works as proposed by T. Aird Murray, whom the council has engaged to devise a system for the disposal of sewage, and who has been engaged on the work for a year or

Results of Trap Tests

PRACTICAL TRAP TESTS.

Table showing results of Trap Tests, Rochester, N.Y., March 10th, 1913.

Examining Board of Sanitary Engineers.

Members of Examining Board:

Frederick E. Fladd,

Thomas A. Morgan,

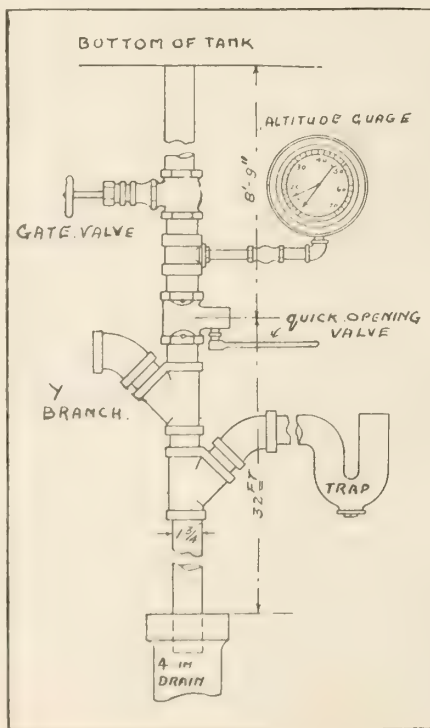
Joseph F. Monaghan,

Edwin A. Fisher, City Engineer, Ex-Officio,

Frank Dumond, Chief Inspector of Sanitary Engineering,

J. Alfred O'Kane, Clerk.

NAME of TRAP.	No. of TRAP.	VARIETY—OR—DESCRIPTION	MATERIAL & FINISH	SIZE	DEPTH OF SEAL	WEIGHT of WATER	WEIGHT of SEAL.	SEAL LEFT.
CUDELL	—	Running Trap	LEAD	1 1/4	2 7/8	15 oz.	4 oz.	1 1/4 INCH
"	13	P. WATER SEAL COVER	"	1 1/4	4 3/8	24 oz.	6 1/2 oz.	1 1/2 INCH
"	11	P. RAISED OUTLET BASIN TRAP.	"	1 1/4	3 1/2	18 oz.	4 oz.	- 3/4 "
"	11	P. STRAIGHT OUTLET.	"	1 1/4	1 3/4	11 oz.	3 oz.	- 3/8 "
"	10	P. BOTH COVERS WATER-SEALED.	"	1 1/4	2	13 3/4 oz.	5 oz.	- 3/4 "
"	12	S. BASIN TRAP.	"	1 1/4	1 3/4	14 oz.	5 oz.	- 7/8 "
"	12	P. PERPENDICULAR BASIN TRAP.	"	1 1/4	1 7/8	15 oz.	4 1/2 oz.	- 3/4 "
ROCH. LEAD WORKS	—	DRUM TRAP 4x6	LEAD	1 1/4	2 1/4	16 oz.	6 1/4 oz.	- 3/4 "
"	—	" 4x8	"	1 1/4	2 1/2	19 oz.	6 1/4 oz.	- 3/4 "
WOLVERINE	—	CENTRIFUGAL	BRASS NICKEL PLATED	1 1/4	4 1/2	12 1/2 oz.	1 1/2 oz.	1 INCH
CODY	—	TRAP	"	1 1/4	4 1/4	16 oz.	2 oz.	- 1/2 "
"	—	"	BRASS	1 1/2	4 1/4	23 oz.	6 oz.	1 INCH
MONARCH	—	"	BRASS NICKEL PLATED	1 1/4	6 1/4	24 oz.	4 oz.	1 "
"	—	BASIN TRAP	"	1 1/2	5 3/4	26 oz.	3 oz.	- 3/4 "
HAYNES-JONES & CADBURY	—	HANOCA BASIN TRAP	"	1 1/2	6 1/4	28 oz.	2 oz.	- 7/8 "
"	—	HANOCA BATH TRAP	"	1 1/2	2 1/2	10 oz.	—	1/8 INCH SEAL BROKEN
"	—	HANOCA " "	"	1 1/2	3 1/4	20 1/2 oz.	3 1/4 oz.	- 7/8 "
WOLFF	—	SANITAS PATENTED	"	1 1/2	2 1/2	15 oz.	2 oz.	- 1/2 "
"	—	"	"	1 1/4	2 1/4	10 oz.	—	JUST SEALED.
TURNER	—	TUBULAR BATH PERPENDICULAR TRAP	BRASS	1 1/4	2 3/8	17 oz.	5 1/2 oz.	- 7/8 "
"	—	DOUBLE SEAL BATH	"	1 1/2	4 1/8	20 1/2 oz.	6 oz.	1 INCH



NEW BOOKLETS.

The American Radiator Co. have recently issued a splendid booklet entitled "The Ideal Fitter." It is full of heating and ventilating data of the finest order. Not only is the data very interesting, but also the method as to how this data is arrived at. Any one requiring one of these books should write at once to The American Radiator Company, No. 20 Victoria Street, Toronto.

TRADE NOTES.

Wallaceburg, Ont. — The Wallaceburg Brass Mfg. Co. have made quite an addition to their foundry to the extent of now being able to double the output. Their goods which are well-known as high grade have become so popular that this step had to be taken. They expect to make a further addition next year, all being well.

Complete Course of Sheet Metal Work

By L. W. KOSER

(Continued from September 15.)

On plate 35 we show how to develop the patterns for a "Coal-Scuttle" the shape and proportions of which may vary to suit the fancy.

Fig. 1 shows an elevation of a coal scuttle. Fig. 2, a half plan.

Fig. 3 a half profile of the orifice or mouth.

Fig. 4 a section through G-S of the elevation.

Fig. 5 the stretchout or true length of the line G-F of the elevation.

Figs. 6, 7, 8, 9, 10 and 11 show the diagrams of sections of solid and dotted

lines giving the true lengths of the solid and dotted lines shown on the elevation. While Figs. 12 and 13 show the patterns of the front and back pieces these patterns being doubled and the seams made on the lines A-G and 4'-m of the elevation or u-v and 4 m of the plan.

First draw the elevation A-X-B-C-D-E F-G Fig. 1 (the base below C-D may be drawn but its development does not enter into this problem it being a simple frustum of a cone explained in the early part of this course.)

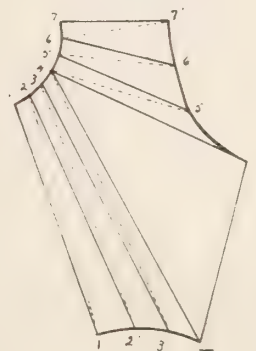
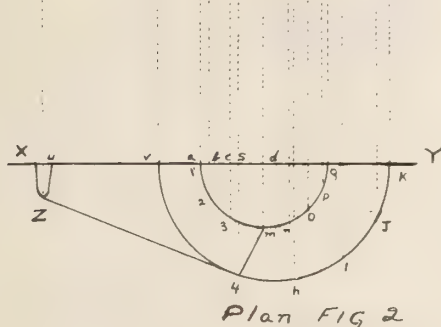
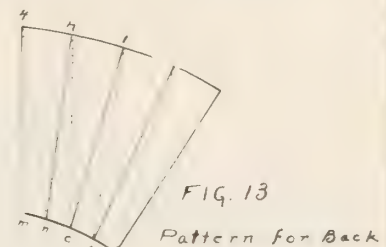
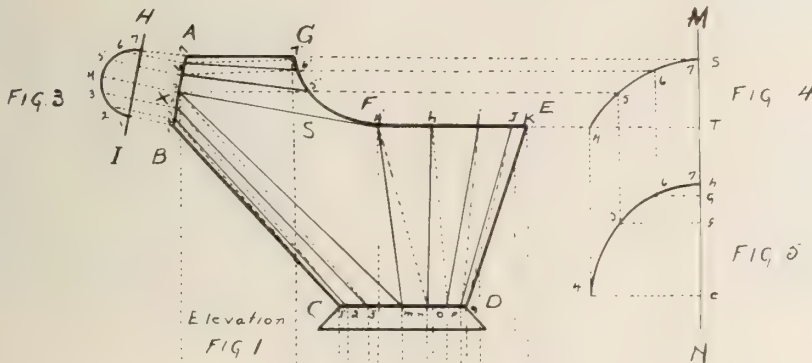
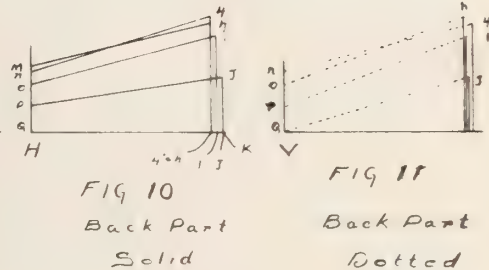
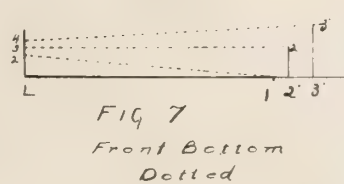
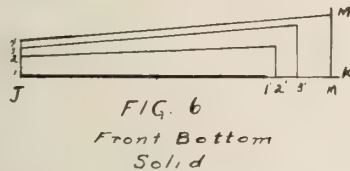
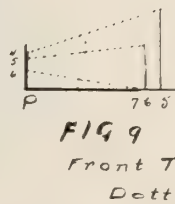
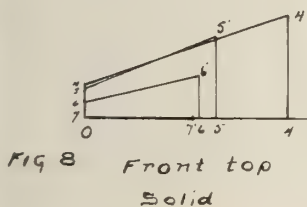
Now draw the plan Fig. 2, first draw-

ing the horizontal line X-Y for the centre of plan, and dropping dotted lines from points X-G-C-D and E locating points u-v-a-q and k.

With a radius equal to half the distance between the a and q, draw the arc a-q and drop a line from the centre thus found to the edge of the arc locating point m.

Then with a radius equal to half the distance between v and k draw the arc v-k and drop a line from the point F of the elevation locating point 4 of the plan.

35



PATTERNS FOR A COAL SCUTTLE.



Connect m and 4 with a solid line which represents the joining line of the front and back pieces.

Make the line u-Z of the plan equal to X-B or X-A of the elevation.

Connect Z and 4 of the plan and the outline of the half plan is completed.

Now divide the arc a-q Fig. 2 into equal spaces as shown by 1'-2'-3'-m-n-o-p-q and carry lines from each point to the base line C-D of the elevation.

Divide the arc 4-k Fig. 2 into the same number of spaces as are shown from m to q of the arc a-q all as shown by 4'-5'-6'-j-k.

Carry lines from each point to the line F-E Fig. 1 as shown by 4' h-i-j-k.

Connect these with solid lines to the points on C-D representing the same space as for instance connect 4' with m h with n, etc., also draw dotted lines from 4' to n, h, to e, etc.

Now draw the line H-I Fig. 3 parallel to the line A-B and a little in front of it.

Carry a line from A and B at right angles to A-B to the line H-I. Draw the semi-circle representing half the plan of the mouth and divide this into equal spaces as shown from 1 to 7 having one point as 4 directly in the centre.

Carry lines from those points past H-I and at right angles to it to the line A-X-B.

From points 1-2-3 and 4 carry solid lines to points 1'-2'-3' and m on the line C-D and draw dotted lines from 4 to 3', 3 to 2' and 2 to 1'.

Before drawing in the lines for the top piece it will be necessary to draw the profile on the line C-S which is shown at Fig. 4.

Draw a horizontal line from points 1' and 2' to the line H-N touching this line at points S and T.

From T on the line F-T lay off the space 4-S of the plan Fig. 2 which is the distance of F from the centre. This gives the location of point 4.

Draw an arc or curve from 4 to S and divide this off into the same number of equal spaces as one-quarter of the plan of the mouth or as the spaces 4 to 7 Fig. 3.

Draw lines from points 5 and 6 Fig. 4 until they meet the line C-F thus locating points 7'-6'-5'-4' of G-F.

Draw from points 7'-6'-5' and 4' lines into 7-6-5-4 respectively of the line A-X and draw the dotted lines as shown.

Before proceeding with the diagrams of sections we will develop the true length of the line G-F as it is necessary to get this in order to get the stretchout of this part of the patterns as its true

length is not shown by either the plan or elevation.

From any point as h on the line H-N lay off each of the spaces shown by 7'-6'-5'-4' of the line G-F making h-g equal to 7'-6' g-f equal to 6'-5' and f-e equal to 5'-4'.

Draw horizontal lines from each point and intersect them with lines drawn from the corresponding spaces above.

A line traced through these points or intersections give the stretchout desired.

We now proceed to develop the diagrams of sections for the solid and dotted lines as follows:

At Fig. 6 draw the line J-K and at J erect a vertical line.

Lay off on this the distance that points 1-2-3- and 4 of Fig. 3 are from the line H-I.

Lay off on J-K from J the length of each of the solid lines of the front bottom section and at their extremities erect a perpendicular line making them equal to the distance they are from the line of the plan Fig. 2.

For instance, at the end of the solid line 4-m erect a perpendicular and make its length equal to the distance that m

The perpendicular at the end of the solid line 3-3' would be equal to the space 3'-e-Fig. 2, etc.

Develop the diagram of dotted lines in the same manner.

For the top front part draw a horizontal line Fig. 8, and at point o erect a perpendicular and lay off on this the distances that points 4-5-6 and 7 Fig. 3 are from the line H-I.

Lay off the length of the solid lines from O and at their extremities erect perpendiculars equal to the distances that points 4-5-6- and 7 Fig. 5 are from the line H-N.

Develop the dotted lines in the same way.

Next develop the diagram of solid lines for the back part as follows:

At Fig. 10 draw a horizontal line and at point H erect a perpendicular line and lay off on this the distances that points m-n-o-p- and q are from the line X-Y of the plan Fig. 2.

Lay off the spaces of the solid lines from H and at their extremities erect perpendicular lines making them equal to the distance that 4-h-i-j and k are from the line X-Y of the plan Fig. 2.

Develop the dotted lines in the same manner.

The oblique lines on the diagrams then are the true length of the corresponding lines shown on the elevation.

To develop the pattern proceed as follows:

Draw the line 7-7' Fig. 12, making it equal to 7-7' of Fig. 8.

With 7 as centre and radius equal to 7-6 of the circle Fig. 3, describe a small arc.

Then with 7' as centre and radius equal to the dotted line 7'-6 of Fig. 9 cut the arc swung from 7' thus locating the point 6 of the pattern.

Then with 6 of the pattern as centre and with a radius equal to the line 6-6' Fig. 8 swing an arc which intersects by an arc swung from 7' with 7-6 of Fig. 5 as radius. Continue thus to the line 4-4' of the pattern using diagrams 8 and 9 and stretchouts Fig. 3 and Fig. 5.

Then with 4' of the pattern as centre and 4'-m of Fig. 10 as radius swing an arc in the neighborhood where m of the pattern is shown.

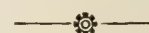
Then with 4 of the pattern as centre and a radius equal to the line 4-3' Fig. 7 swing an arc which intersect by another one swung from m as centre and a radius equal to m-3' of the plan Fig. 2.

Continue thus until this part is completed using diagrams 6 and 7 for solid and dotted lines and spaces on Fig. 3 for stretchout of the neck and spaces m-3'-2'-1' of the plan Fig. 2 for the stretchout of base.

To develop the pattern for rear piece first draw the line 4'-m Fig. 13 making it equal to 4'-m of Fig. 10.

Then with 4' as centre and radius equal to 4'-n of Fig. 11 swing an arc which intersects with one swung from m as centre and m-n Fig. 2 as radius.

From n as centre and n-h Fig. 10 as radius swing an arc which intersects with one swung from 4' as centre and radius equal to 4-h of the plan. Continue thus until the pattern is developed.



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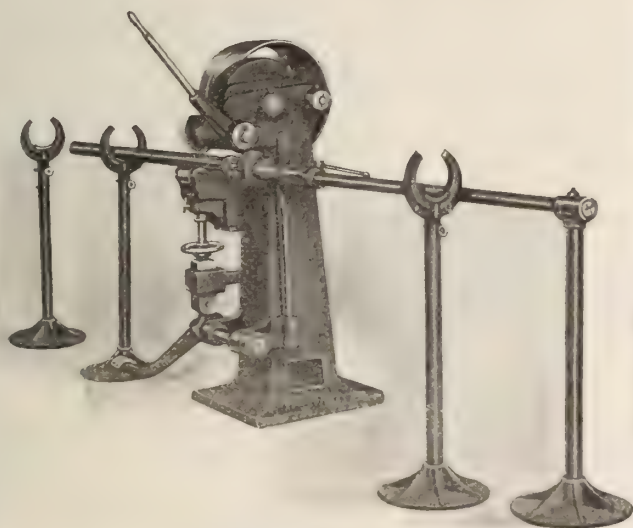
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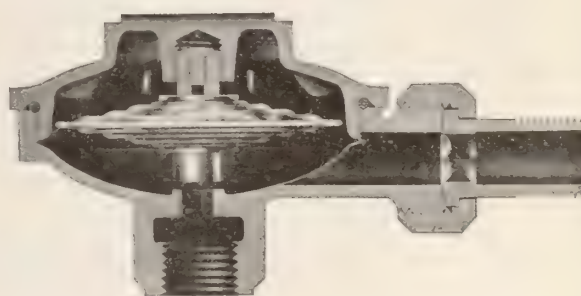
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¶ There would be more and greater business successes if there were more Cass Gilberts as advertising managers and more Woolworths to back them up. Advertising successes are built up just as the Woolworth building was—storey after storey, according to a preconceived and well defined plan.

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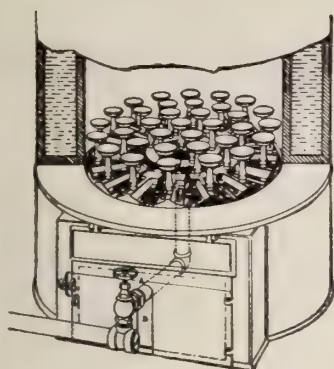
¶ But once that building goes skyward, neither the adverse winds of competition, nor the earthquakes of changing conditions and hard times will ever shake it! There is only one condition—the foundation must be as solid as the rock upon which the Woolworth Building stands, and that foundation must be Honest Goods and Honest Prices and Honest Service. If you can build on these, there is no limit to the possibilities of your business. Otherwise your structure will totter and crumble over your head—as it should.

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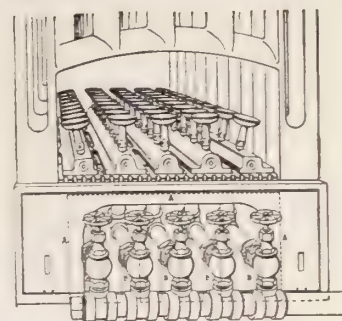
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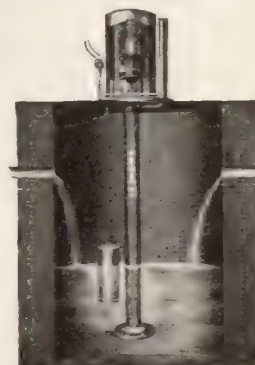
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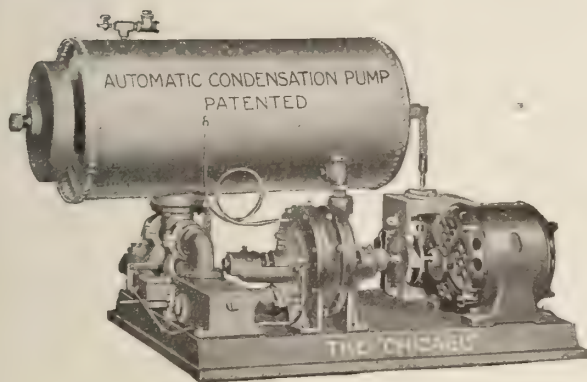
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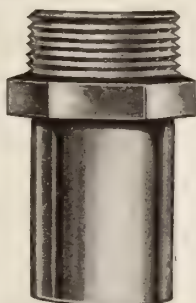
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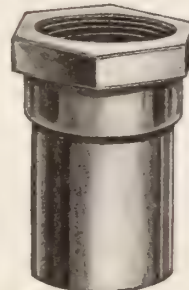
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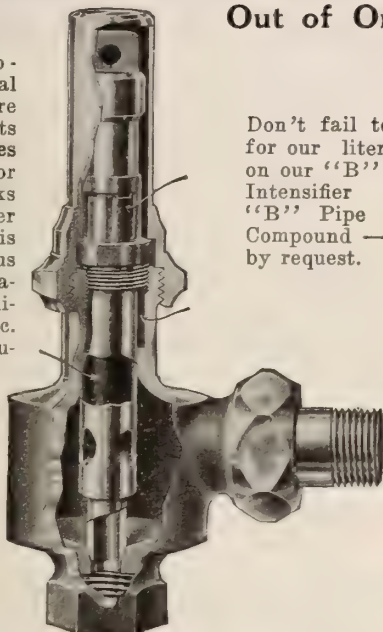
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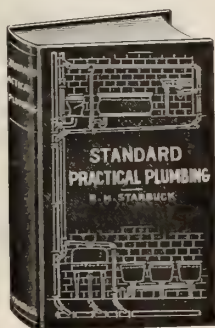
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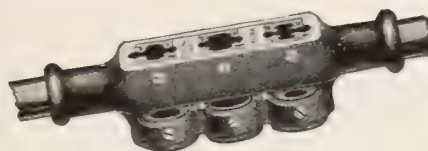
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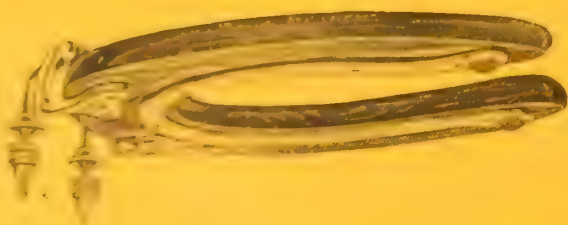
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THE SANITARY ENGINEER PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL 701-702 Eastern Townships Bank Bldg.
LONDON ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

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Vol. VII.

Publication Office : TORONTO, NOVEMBER 1, 1913

No. 21



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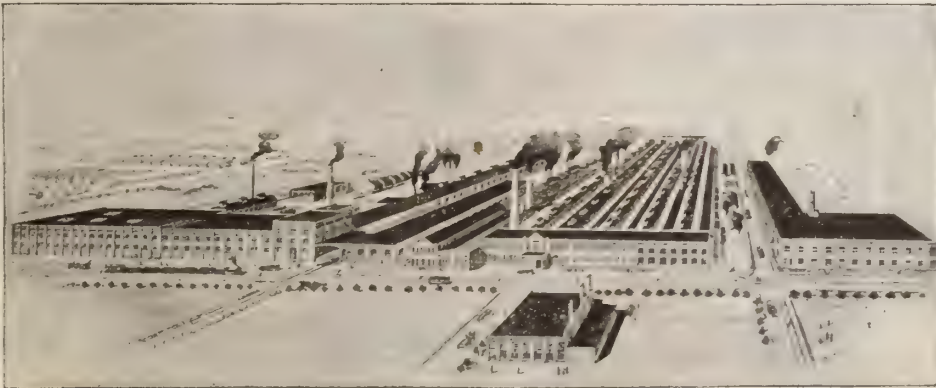
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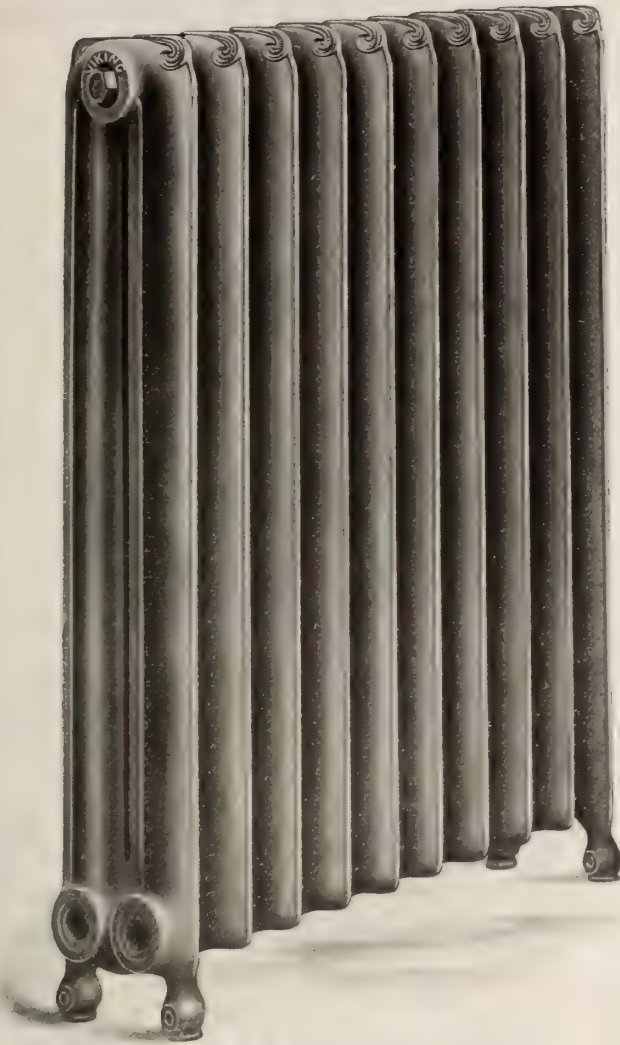
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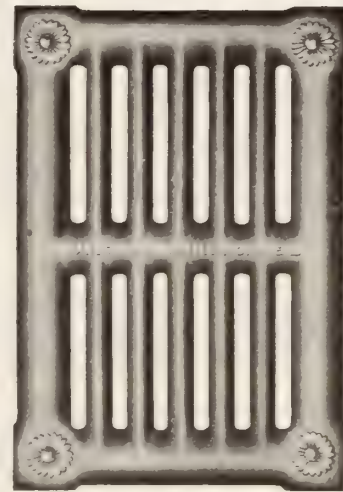


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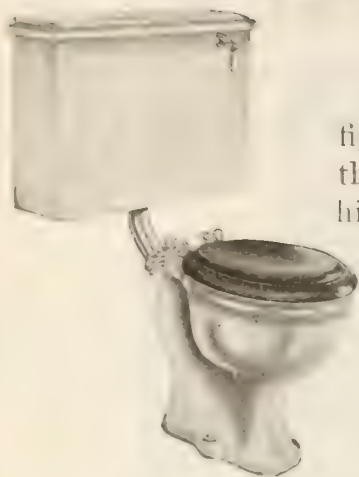
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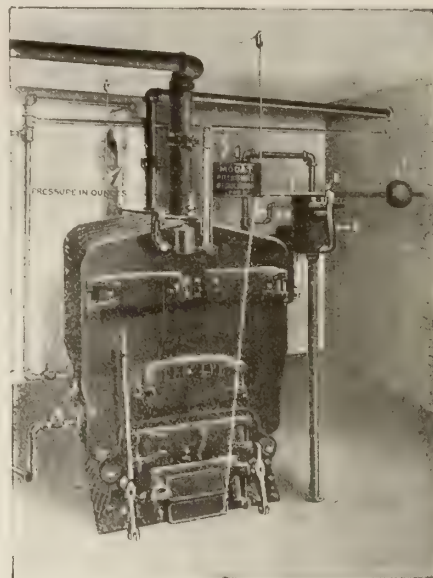
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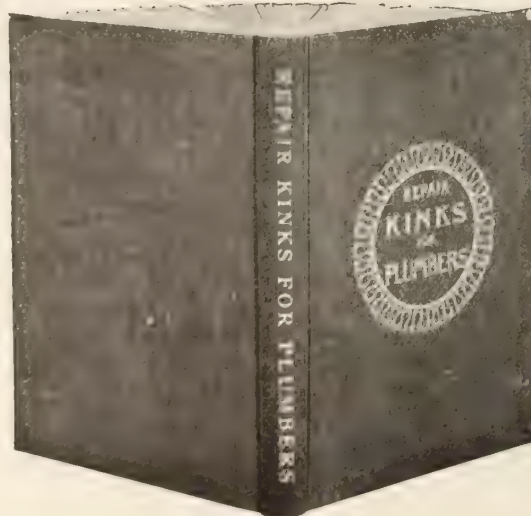
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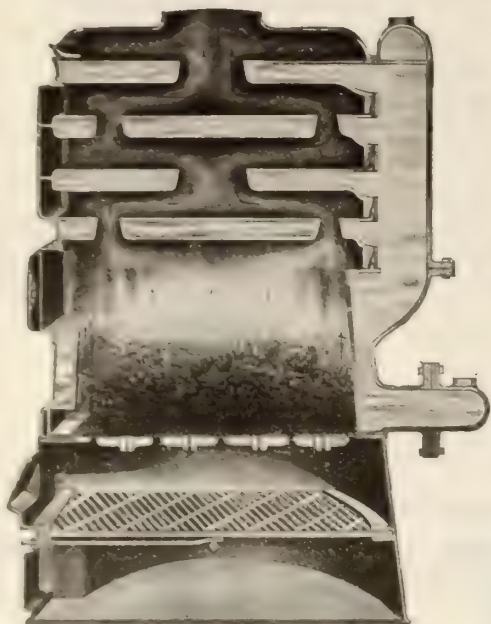
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The State of Wisconsin Plumbing Laws

These Amendments Are Intended to Regulate Who May and Who May Not Engage in the Installation of Sanitary Engineering—Some Very Fine Clauses Not Embodied in Our Canadian By-laws, Neither Provincial or Municipal, with Editorial Comments.

Chapter Laws of 1913.

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. Sections 959—53, 959—54, 959—55, 959—56, 959—59 and 959—59m of the statutes are repealed.

Section 2. There are added to the statutes six new sections and a new sub-section to read: Section 959—53. 1. (a) A journeyman plumber is hereby defined to be any person other than a master plumber, who, as his principal occupation is engaged in the practical installation of plumbing.

(b) A master plumber is hereby defined to be any person skilled in the planning, superintending and the practical installation of plumbing and familiar with the laws, rules and regulations governing the same.

(c) A plumbing contractor is hereby defined to be any person, firm or corporation engaged in the business of installing plumbing in connection with the dealing in and selling of plumbing materials and supplies.

2. In any city of this state except cities of the fourth class having a population of five thousand or less no person shall engage in or work at the business of master plumber or journeyman plumber, and no person, firm or corporation shall engage in or work at the business of a plumbing contractor, unless licensed so to do by the state board of health in the manner herein provided.

3. The state board of health is hereby authorized and empowered to grant and issue licenses and permits to master plumber or journeyman plumber, and plumbing contractors as herein after provided for.

Section 959—54. Any person desiring to engage in or work at the business of a journeyman plumber or master plumber in this state shall apply to the state board of health for a license and be by said board examined as to his fitness for such work either as a journeyman plumber or as a master plumber as the case may be.

Any person, firm or corporation desiring to engage in or work at the business of a plumbing contractor in this state shall apply to the state board of health and be by said board first duly licensed to engage in such work. Every plumbing contractor shall be required at all times to have a licensed master plumber in charge of installing plumbing as a condition for the continuance of his or its license as such.

Section 959—55. 1. The state board of health, shall, within sixty days after the passage and publication of this act, appoint, and shall have power to remove, three plumbing examiners, of whom one shall be a master plumber, one shall be a journeyman plumber and one shall be a member or an employe of the state board of health, to be known as the committee of examiners for the examining of journeyman and master plumbers as to their qualifications and fitness to be entitled to licenses to engage in the work of master plumbers and journeyman plumbers herein provided for. Such examiners shall be exempt from the provisions of sections 990—1 to 990—32 of the statutes. The state board of health shall have power and authority and it shall be its duty to prescribe, amend and enforce rules and regulations for the examination and licensing of journeyman and master plumbers and the licensing of plumbing contractors consistent with this act.

2. Each member of said committee of examiners, except a regular employe of the secretary of the state board of health, shall receive a compensation of ten dollars per day and expenses for each day in which such member is actually engaged in attendance upon the meetings of the committee, to be audited and paid out of the general fund of the state treasury and charged against the appropriations account of the state board of health to carry into effect the provisions of sections 959—53 to 959—58, inclusive of the statutes.

3. The licenses of journeyman and

master plumbers provided for in section 959—53 of the statutes shall be issued by the state board of health upon evidences, as shown by the examination of the fitness of the applicant for the business or practice of a master plumber or a journeyman plumber as the case may be. Plumbing contractors shall be licensed without examination as to qualifications and fitness to engage in the practical installation of plumbing.

4. The State board of health shall have power to revoke any journeyman or master plumber's license if same was obtained through error or fraud, or if the recipient thereof is shown to be grossly incompetent, and for a second wilful violation of any rules and regulations prescribed by the State board of health; the State board of health shall also have power to revoke any plumbing contractor's license, if the owner thereof shall be guilty of a second wilful violation of any rule or regulation prescribed by the State board of health; provided, that before any license shall be revoked, the holder thereof shall have notice, in writing, enumerating the charges, and at a specified date named therein, not less than five days after the service of such notice, be given a hearing by said board and have an opportunity to produce testimony in his behalf. The State board of health shall have power to appoint, by an order in writing, its secretary or any competent person to take testimony, who shall have power to administer oaths, issue subpoenas and compel the attendance of witnesses, and the decision of the State board of health shall be based on its examination of all testimony and records. Any person whose license has been revoked may, after the expiration of one year from date of such revocation, apply for a new license.

Section 959—55a.—1. All persons at the time of the passage and publication of this Act engaged in the plumbing business in this State, either as master plumbers or journeyman plumbers or plumbing contractors, shall be respectively licensed as such by the State board of health without examination.

upon the payment to the State board of health of the license fee hereinafter provided. No person who desires to engage in the business or practice of plumbing, either as a master plumber or a journeyman plumber, after the passage and publication of this Act, shall be granted a license until he has passed a satisfactory examination. Before any applicant shall be permitted to take such examination he shall pay to the State board of health the examination fee as herein provided for.

2. The State board of health shall prescribe and shall have power to amend the rules and regulations governing plumbing, drainage, sewerage and plumbing ventilation in connection with all buildings in this State, and may prescribe minimum standards which shall be uniform throughout the State. This Act shall not be construed to deny the right of any local governing body having jurisdiction to adopt and enforce additional rules and regulations relating to plumbing, drainage, sewerage and plumbing ventilation not inconsistent with the provisions of this Act or the rules and regulations prescribed by the State board of health. Nothing contained in sections 959-53 to 959-58, inclusive, of the statutes shall be construed to affect the authority of the industrial commission relative to places of employment or public buildings, other than hotels, restaurants, rooming houses and school buildings.

3. The State board of health is empowered to employ, promote and remove plumbing inspectors and other assistants as needed, to fix their compensation and assign their duties. Such salaries, compensations and expenses shall be paid out of the general fund of the State treasury and charged against the appropriation account of the State board of health for carrying out the provisions of sections 959-53 to 959-58, inclusive, of the statutes.

Section 959-55b. — 1. All master plumbers engaged in business as such in the State, desiring to continue as such, are hereby required to procure a master plumber's license from the State board of health within sixty days after the passage and publication of this Act, the fee for which license is hereby fixed at ten dollars, such license, unless sooner revoked, to expire on December 31 next after the issuance thereof, but no examination shall be required of such master plumbers making such application for license within the time hereby limited. Commencing January 1, 1914, and annually thereafter on January 1st of each year, a renewal of such license by all master plumbers, theretofore licensed, continuing in business as such within this State.

2. All journeyman plumbers engaged

in business as such in this State desiring to continue in business as such, are hereby required to procure a journeyman plumber's license from the State board of health within sixty days after the passage and publication of this Act, the fee for which license is hereby fixed at two dollars, such license, unless sooner revoked, to expire on December 31 next after the issuance thereof; but no examination shall be required of such journeyman plumbers making such application for license within the time hereby limited. Commencing January 1, 1914, and annually thereafter on January 1st of each year, a renewal fee of one dollar shall be paid to the State board of health for a renewal of such license by all journeyman plumbers, theretofore licensed, continuing in business as such within this State.

3. All plumbing contractors engaged in business as such in this State, desiring to continue as such, are hereby required to procure a plumbing contractor's license from the State board of health within sixty days after the passage and publication of this Act, the fee for which is hereby fixed at forty dollars, such license, unless sooner revoked, to expire on December 31 next after the issuance thereof. Commencing January 1, 1914, and annually thereafter on January 1st of each year, a renewal fee of twenty dollars shall be paid to the State board of health for a renewal of such license by all plumbing contractors, theretofore licensed, continuing in business as such within this State.

4. All licenses issued during any year, unless sooner revoked, shall expire on December 31 of such year.

5. A master plumber's license shall entitle the owner thereof to all the rights and privileges of a journeyman plumber.

6. The fees for any person hereafter desiring to engage in the business of a journeyman plumber or a master plumber in this State, and not licensed within sixty days after the passage and publication of this Act, shall be respectively two dollars and ten dollars, and the fee for any person, firm or corporation hereafter desiring to engage in the business of a plumbing contractor in this State, and not licensed within sixty days after the passage and publication of this Act, shall be forty dollars.

7. The State board of health may issue temporary permits to engage in the work of a master plumber or a journeyman plumber on payment of the fees prescribed in this Act; such permits may be revoked by the State board of health at any time, and if on examination a license is granted, the fee paid for the permit shall run for the same period as though paid for a

license. For the purpose of assisting in its work of issuing such temporary permits, the State board of health may appoint agents without compensation.

8. Any person working as an apprentice at the business or practice of plumbing, for a reasonable time, desiring to take an examination for a license as a journeyman plumber, may file his application for such examination with the state board of health herein provided, and upon giving due notice of the filing of such application with said board, may be granted a permit by the state board of health to pursue said work in the capacity of journeyman plumber until such time as said examining board shall have an opportunity to examine him. No journeyman plumber shall engage in business as a master plumber without first having been granted a temporary permit and may not continue in such business unless thereafter licensed as such by the state board of health as herein provided, the fee for which permit or license is hereby fixed at fifty dollars; and shall thereafter expire and be renewed from year to year in the manner hereafter provided.

9. The state board of health may license without examination, upon the payment of the required fee, applicants licensed under the laws of other states having requirements for licensing and regulating plumbing which are determined by the state board of health to be equivalent to the requirements of this state.

Section 959-56. 1. Any person who shall engage in the work of a master or a journeyman plumber for compensation without a permit or a license as provided in sections 950-53 to 959-56, inclusive, of the statutes, shall be deemed guilty of a misdemeanor and shall be subjected to a fine of not less than ten dollars nor exceeding fifty dollars, or imprisonment in the county jail not exceeding thirty days for each and every violation thereof. Each day of such violation shall constitute a separate offence.

2. Any person who shall violate any of the provisions of sections 959-53 to 959-56 of the statutes, inclusive, or shall do any act prohibited in sections 959-53 to 959-56, inclusive, or shall fail or refuse to perform any duty lawfully enjoined within the time prescribed by the state board of health, or shall fail, neglect or refuse to obey any lawful order given or made by the state board of health, or any judgment or decree made by any court in connection with the provisions of sections 959-53 to 959-56, inclusive, for such violation or refusal shall be guilty of misdemeanor and shall be punished by imprisonment in the county jail not more than three

months or by a fine not exceeding one hundred dollars.

(Section 172—27, 2. All moneys received by the state board of health for the licensing of plumbers shall be paid within one week of their receipt into the general fund of the state treasury and all such moneys are appropriated to the state board of health to carry into effect the provisions of sections 959—53 to 959—58, inclusive, of the statutes.

Section 3. Sections 959—57 and 950—58 of the statutes are amended to read: Section 959—57. In each city of the first, second and third class having a system of waterworks or sewerage, the board of public work, where such board exists, or the board of health of each such city shall and cities of the fourth class may * * * appoint one or more inspectors of plumbing who shall be practical plumbers, and who shall hold office until removed by said board for cause. The compensation of such inspector or inspectors shall be determined by the board appointing them and be paid from the city treasury; they shall inspect all plumbing work in the city for which appointed, whether such work be new or consist of alterations or repairs; and shall report to said board all violations of any law, ordinance or by-law relating to such work and perform such other appropriate duties as may be required.

Section 959—58. Each city of the first, second and third class having a system of waterworks or sewerage shall and cities of the fourth class may, by ordinance or by-law, prescribe rules and regulations for the materials, construction, alteration and inspection of all pipes, faucets, tanks, valves and other fixtures by and through which supply or waste water or sewerage is used * * * or carried, and provide that they shall not be placed in any building therein except in accordance with plans which shall be approved by the board of public works, where such board exists, or the board of health of such city, or such person or persons as either of said boards may designate; and shall further provide that no plumbing shall be done, except in case of repairing leaks, without a permit being first issued therefor upon such terms and conditions as such city shall prescribe; provided that no such ordinance, by-law, rule or regulation prescribed by any such city shall be inconsistent with this act or any rule or regulation adopted or prescribed by the state board of health; and provided further, that no city shall be authorized to or require the licensing of journeyman or master plumbers or plumbing contractors, or prevent any such plumbers or plumbing contractors who are licensed under the provisions of this act from engaging in or working at

the business for which they are respectively licensed in any place in this state.

Section 4. All acts or parts of acts in conflict herewith are hereby repealed.

Section 5. This act shall take effect and be in force sixty days from and after its passage and publication.

Assembly: Ayes, 71; Noes, 3.

Senate: Ayes, 17; Noes, 4.

Editor's Note.

These laws as will be seen by our readers are not intended to govern the installation of sanitary engineering, but rather define who may or may not engage in the trade. For instance in reading section 959—54 it specially states that no one will be allowed to install any construction of sanitary engineering in the **State of Wisconsin** until he has first procured a license from the board of examiners of that state. Such a clause would be of great benefit to those engaged in the craft here in Canada. Our small towns are having sanitary engineering installed by men who are neither licensed or qualified. The results are that cesspools are being installed even though it is strictly illegal. There should be provincial sanitary inspectors to look into these matters. We could cite cases where beautiful residences are being and have been recently built in which cesspools are being put in with impunity. Some towns are polluting the lakes, rivers and streams and while recently there has been a considerable amount of good work done, these towns should be warned by our provincial governments through the daily press. These towns which to-day are small, will be large cities very soon and what will then be the condition of their sanitary engineering?

Should be Competent.

Whereas, if everyone engaged in the trade throughout the provinces were licensed men and this poor work was installed, even though an inspection was not enforced at the time, any faulty construction could be laid at the door of the person who installed it. While discussing this matter it may be mentioned that it is the opinion of most first-class sanitary engineers that every new installation should bear the name of those who put in the sanitary engineering as well as the date. We cannot be too particular, and to begin right is to do as Wisconsin is doing, viz:

Fine Unlicensed Men.

Define who shall engage in the trade and fine heavily anyone found installing these equipments unless they are licensed men. There are firms to-day in cities and towns where certain by-laws

governing the construction of sanitary engineering are in vogue, who when receiving a contract to install a sanitary equipment in a country town where no such laws exist, simply put in any kind of construction and cesspools galore.

This should not be allowed for one moment, and if those engaged in the craft could be made to realize their responsibility to the human race, such work would not be done, we will here cite a particular instance. In a small town in Ontario a man who for 15 years had been engaged in this trade, was asked to draw plans and get cost of an equipment for an up-to-date residence. He got a list of material and cost of same. This list was sent to a jobber for a price. Now there was no sanitary engineer doing business in this town, but about 50 miles away there were several engaged in that line.

Less Than Cost of Material.

When the figure was received for the necessary material the cost seemed to run into more money than was expected, so one of these men in this town 50 miles or so away was asked to give a tender on the job complete. The plans were submitted and they were to govern both the job and price.

However, the person who had drawn the plans and made out the specifications, left the locality for a visit down south, and on his return, it was found the owner had got an installation completed and ready for use for over \$30 less than the jobber wanted for the material. Upon enquiry it was found that the job had the very cheapest class of fittings, cheap work, poor caulking and joints, in fact it was a disgrace. The owner has the satisfaction of knowing he has got a cheap job, but before long he will have to send 50 miles to get his repairs done.

If our craft would be more dignified and reason out that in such cases as this they have a certain amount of responsibility this cheap work would soon cease to exist.



TRADE NOTES.

At the recent meeting of the National Association of Brass Manufacturers, held on September 16 and 17 in Niagara Falls, one of the questions taken up and adopted was a uniform standard flange for bibb cocks of varying sizes.

The Lunkenheimer Company of Cincinnati, Ohio, have purchased a block of property adjoining their present plant. It is their intention to build a large new foundry, which is to be a three-storey building, 150 x 350 feet. The Lunkenheimer Company are well known to the trade as manufacturers of high-grade valves, lubricators and the like.

Is Technical Education Beneficial to Sanitary Engineers?

Showing the Reasons Why Our Forefathers Were Plumbers, and How We May Evolve to be Thorough Practical Sanitary Engineers by Taking Advantage of the Technical as Well as Correspondence School Courses, Which Were Denied Our Forefathers.

By PROFESSOR ARTHUR BATEMAN, Chicago.

There is a wide diversity of opinion on this interesting question and those possessing little or no knowledge of the subject or the methods of teaching the work, are agreed that it is useless, and unfortunately hold the opinion that it is all theory which will not procure the mechanic his livelihood. However, if we take another view of the question, how many of us can call to mind numerous instances where plumbers have become quite proficient as workmen without knowing the reason why they execute a great many things, and are consequently at a loss when unusual difficulties present themselves, or some work has to be accomplished which their fathers or forefathers before them had no knowledge of.

A case in point is readily observed by perusing the apparently endless "Queries" appearing in the various "trade journals." These questions, although numerous are very similar in the main, and the answer is invariably based on some physical law or other.

Again, is it possible to understand the working of siphons, pumps, flush tanks, siphon action water closets, the siphonage of traps, etc., etc., unless the composition, pressure, and properties of the atmosphere are thoroughly grasped.

Is it not imperative that every sanitary engineer be conversant with the character of various waters, their action upon metals and how the plumbo-solvent action is contracted. Doubtless some of us can recall instances of domestic hot water installation being wretched failures, oftentimes due to the construction of the building differing to such an extent that an entirely original system of supply must be devised. Where is the rule-of-thumb man now. He knows nothing of connection currents, nor the peculiar behavior of water when heated, or when heat is abstracted, with the inevitable result, failure.

Still further, is it sufficient for a sanitary engineer to know that solder is composed of lead and tin, that a lead joint needs caulking to secure soundness, and countless other items which space will not permit an explanation of.

When the question now arises, "How can these objectionable features be obviated, and the solution may be found in the technical schools with evening classes for apprentice and other plumb-

In the days when the writer commenced his apprenticeship, the journey-men would not only permit him to attempt practical work, but would stand over him some two or three hours daily, giving instruction and offering most valuable suggestions. A truly ideal training for any youngster, yet is it sanity in these days of keen competition to expect this of any master or journey-man?

No, the general adoption of the above mentioned classes could not help but be beneficial to both employers and employees.

A well equipped school should be provided in all our large cities and towns where these men could attend, say, three evenings per week and receive adequate instruction in the scientific art and craft of plumbing, coupled with practice in joint wiping and constructional work, under actual working conditions. A small fee of \$5 per session might be charged and refunded to satisfactory students at the close of the session. Much money is expended annually for medical research and the cure of disease, why not invest a small sum on the prevention of disease, further sanitary science and help the community in general.

Of course, the city men have a decided advantage over those in the small localities, but where there's a will there's a way, and ambitious persons outside the range of such technical schools can always have a course of lectures, instructions, blue prints, etc., mailed to them by a reputable correspondence college. Joint wiping, etc., can be practiced in their own basements, so fellow-craftsmen hustle, always remembering that consistency in labor will conquer all difficulties.

Throughout Europe, technical schools are in vogue in nearly all towns over 60,000 population, and are supported by the Government out of the revenue derived from the high duty on whiskeys. However these classes do not confine themselves entirely to sanitary engineers, but admit civil engineers, architects, etc., which in the writer's opinion is most detrimental to the craft.

These men only acquire a theoretical knowledge, which in itself is useless, but of late years the examining authorities appear to have forgotten the classes are run expressly for the benefit of

sanitary engineers, and cater for these high class engineers. Raising the standard of the work they call it, but may our organizations here preserve us from such a state of affairs, for experience teaches me it tends to kill the ambition of the plodding student, or if he happens to be successful, he invariably becomes dissatisfied with his work and clamors for the position of sanitary inspector, or the like.

The writer trusts that these opinions will not be considered too dogmatic. They are his views to-day and are offered only in sufficient dogmatic fashion to provoke discussion. To-morrow he is prepared to change them when hearing better views to substitute for them.



NATURAL PLACE FOR PLUMBING INSPECTION WITH BOARD OF HEALTH.

Peterboro, Ont. — Dr. McPherson, Medical Health Officer, suggested at the Board of Health meeting recently that the matter of plumbing inspection be placed in the hands of the health department; that the sanitary inspector be given an assistant; that the issue of building permits be also placed under the hand of the department, and that the inspector have the milk vendors' licenses under his supervision.

By supervising the building permits, it was pointed out, the inspector could warn any person against erecting, say, a stable that might, in the future, be a menace to public health. Mr. Spence said that in the south end a stable was being erected four feet from a house, and the odors would penetrate through the house.

Mayor Bradburn explained that the inspector could look over the building permits in the city clerk's office, and he could give the necessary warning.

"The natural place for plumbing inspection," said the Medical Health Officer, "is under the control of the Board of Health. It could be combined with sanitary inspectorship, and Mr. Spence could be given an assistant."

The sanitary inspector claimed that there were cases of plumbing where the closets were placed in an unsanitary position and the ventilation was poor. He could point out the defects and have them remedied.

Forestalling Cheap Plumbing and Heating, Etc.

Dealing With An Article Which Appeared in a Recent Issue of "Commercial," Showing How the "Innocent Householder May Be Spared the Trouble with Poor Installations

Troubles from cheap plumbing competition would be minimized if some scheme could be devised whereby the innocent householder could become posted fully on the equipment which he is about to purchase. The competitive plumber, steamfitter, sheet metal worker or furnaceman is able to instal inferior equipment and slight his work because in the majority of instances the house owner is not competent to judge what constitutes a good, bad, or indifferent job. The installation may appear satisfactory to the owner, and may even operate with satisfaction for a few months, but in the majority of cases so sure as it is a cheap installation just so sure is trouble to arise.

For example, a cheap plumbing installation may appear all right at first, but after a few months occasions for having repairs made are frequent. The cheap furnaceman is frequently able to instal a heating system in a most indifferent fashion and get his money in full for it before it has been given a rigorous test by the severe winter weather. Usually the furnaces are installed in the summer and early fall, and although the work may be of an inferior character the showing during the mild weather satisfies the house owner. And so the cheap mechanic is enabled to ply his practice, and all because the home builder is not educated on the several component parts of a comfortable house. It would, therefore, seem reasonable to presume that if the owner were to be educated on what constitutes, say, a good heating system, he would not tolerate having the work done other than in the most approved fashion.—

"Winnipeg Commercial."

If the public at large would take this matter up in real earnest the problem of minimizing the quantity of cheap or rather low-priced plumbing and heating would soon be solved. We may hear it said that low-priced plumbing was never heard of. But let me say right here that having regard to the actual skill that is necessary to instal first-class plumbing (by the way, we will not refer to this line of work as plumbing, but sanitary or heating engineering, for such it is) the class of craftsmen who are in business at the present day are the poorest paid of any other mechanics on the job.

For instance, let us draw a picture. We go to a music store and pay from \$200 to \$400 for a piano; we buy a parlor suite for at least \$100; a rug \$50; one or two more little acquisitions, say, another \$100. Say we cut these figures

and make it an even \$600 for one room, which we only use possibly two or three hours a day. We never kick about the price we pay for these goods. But what happens when we have sanitary or heating engineering installed in our home? This is an absolute essential to our health and comfort; in fact, no part of the whole structure in any shape or form is called upon to play as active a part as this portion of our residence.

There is more actual wear and tear and more abuse than use put into practice, partly because of the ignorance of those who use it, and, in fact, more than 90 per cent. of the repairs are the result. First, because a cheap job was demanded, and second, ignorance on the part of those who use this apparatus.

Peddlers of Prices.

When an owner wishes to build a house he goes to an architect and lays out what he would like to have. He instructs the architect to get prices on his sanitary and heating apparatus. When he receives them, he peddles them all around the town, and in many cases makes false statements to the effect: Smith will do it for so much; Jones for so much, etc.; and the foolish sanitary engineer bites and takes the job at such a figure that he simply has to put in the poorest and cheapest class of fittings that can be bought; and, as our correspondent states, all seems O.K. for a while, etc. In other cases the owners will buy the material from some "friend in the trade wholesale," and then go to a man who is nothing more than a tinker and cannot do a good job, a man who is simply working for himself, because no first-class sanitary and heating engineer will hire him. This cheap jack has nothing to lose, not even a reputation, but still the innocent householder will keep on giving these men work, and hence they get stung, which serves them right.

Then another argument is put forth by the householder, and that is he feels his interests will be guarded by the plumbing inspector. Well, well, more innocence is again displayed. Anyone who tries can boil an egg in a paper bag, or can make tissue paper hold water "for a few minutes." The same argument applies to sanitary fixtures, etc., and they all stand the tests "for a while," and so it goes on. On the other hand, when the householder goes to buy a piano, he or she goes to a firm of good repute, not to a second-hand store or to some cheap jack. He buys by faith and relies on the reputation of the manufac-

turer of the instrument. He is no judge as to the real quality of the piano. But the firm has a good reputation, and he has heard of quite a few people who have bought the same piano, and so on. But does he try and peddle the price round? "No, sir." If he wants a certain class and make of piano he has to pay the price, and thereby gets value.

A Scheme to Solve the Problem.

One cannot expect the householder to ever become educated enough to discriminate between poor sanitary or heating installations and good ones any more than in the case of choosing a piano. Hence one should first of all consult a good firm or man of good reputation, an engineer who by actual accomplishments has been proved to do first-class work. Tell him your wants, and that you want a regular agreement free from technical phraseology; see the goods that are to be installed; ask for the "quality label"; insist on all the brass goods having the manufacturer's name on, and give him to understand you will hold him responsible for the workmanship; this to be one of the clauses in your agreement. Then pay the price. You may say that the fittings may be defective, and the man who installs them cannot be held. Let us here state that the best firms in Canada would welcome the return of any of their goods, which have actually been found to be defective. They are as a whole doing their best to turn out a good, honest piece of goods, hence they put their name on their products.

The Furnace Question.

It is the same with the furnace—hot air in particular. It requires so little real skill to instal a hot air furnace these days, and the public will insist on low prices that they have themselves to thank.

In conclusion, let us mention this: If the public will look around they will find more rich piano and furniture dealers than sanitary and heating engineers, and all that is necessary is to buy a cheaper piano, a lower-priced wallpaper, a little cheaper quality parlor suite, and all other household commodities which are not put to real hard usage, and insist on first-class sanitary fixtures, a good quality furnace, and plenty of radiators if the furnace is hot water or steam. Then employ a man or company, who have a reputation to lose, to instal these goods. Pay the price, and cease knocking the other fellow, for your own ignorance and your worries will be over. Thus the problem will be solved and not till then.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year.
United States, \$1.50, Great Britain and
Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorrigan, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary,
Heating and Ventilating Engineers,
Gas Fitters, Sanitary Inspectors,
City Engineers, Boards of Health
Architects, etc.

TORONTO, NOVEMBER 1, 1913

INDIVIDUALITY IN THE INSTALLATION.

In several cities and towns we find the same cry: "I can't buy the goods for the price at which So and So is going to instal the whole job complete. I don't know how he does it." Well, reader, there are several ways such jobs are being done. For instance, take a job of heating. You are asked to put in so many hundred feet of radiation. You tender on that amount; it is your intention to put in that number of feet, but you find your price was too high, etc. What is the reason? You were very careful in looking over the plans and found you had considered every phase in the equipment. You were anxious to get the job, but failed. Now, in the first place, you wanted to do an honest job, put in what was asked for and follow out the plans and specifications to the letter.

The Job Completed.

However, time goes on and you go along with your regular work, when some evening you pick up your evening paper and find that the heating in such and such a building is not giving satisfaction. You become curious with the result that you try to get a look at the job only to find out that, first, the valves are a make commonly known as the "just as good class," but not what were specified. You take note of the amount of radiation in certain rooms and find that about two-thirds of the amount has been put in that was asked for in the specifications. The pipe covering is poor. The whole installation has the look of having been "thrown together" and you go away from the job with a feeling of disgust.

You are ashamed to see such a job installed and feel that you would rather never do a job than take it at so low a price that it would be a discredit to your character.

Make Your Contracts a Credit to the Craft.

This comes down to the ever present question of price-cutting. In the first place at this day our customer wishes to know what a job is going to cost him. It requires expert knowledge to give that information, then make a charge for it, and build up a reputation for good work. Refrain from cutting your price to meet your competitor's, because if you do, the chances are you will either lose money, or resort to dishonest practices to enable you to come out even, just as the contractor spoken of at the

opening of this article. The plain facts are that your best course to follow would be to tender your price with sufficient margin of profit to enable you to give your customer a first class job.

More Soul in Your Work.

This brings us to another phase of the subject. Several years ago there was a sameness displayed in the layout of work done by the old-time plumber and steamfitter. Whether the building was small or large the same method seemed to be adopted somehow. Plumbing designs were identical. Steamfitting, too, had the same look about it. There was no individuality about the work. Very seldom a name plate could be seen and even now it is a sight for sore eyes to see the name of the sanitary and heating engineer on the job he has installed. Why? Because we do not put enough soul in our undertakings. We are only in the trade for the mere dollars and cents when such should not be the case. We should feel proud of our accomplishments.

Make the World Better.

No craft in existence can leave so many actual accomplishments of usefulness as can the sanitary and heating engineer. We have artistic architecture. We have art, and numerous other feats of an artistic nature. But, how many are actual necessities? Not one.

Public Sentiment.

To-day the general public have come to the stage where they almost dread having to go to a sanitary or heating engineer to get work done, and why? Simply because they have come to be so dissatisfied with the actual accomplishment of the average sanitary engineer. Now, one of the main troubles is this: We allow a customer to feel he or she is getting a fairly good job at a very low price, when all the time the price has been cut down to such an extent that there is really nothing in it. The fact is, the public should be shown in some concrete way that it is only by selecting the best material, which, of course, costs most at the first, and then by employing the man or firm who has won the confidence of most people by hard earned reputation that good results can be had. For instance, when a customer begins to tell you about a price some other man has tendered it is your duty both to

your patron as well as to yourself to turn a deaf ear to such conversation in as courteous a manner as possible. Show them what you can do for the price you quoted and let them see the goods. Or if on the other hand you do not keep a stock such as is called for, give them the number in the catalogue and the description and any other information you can interest them in, but whatever else you do, never cut down your price.

Keep Your Own Counsel.

Not very long ago an incident was recalled to the writer where a certain sanitary and heating engineer was asked to tender on a pretty fair sized job and when his tender was about to be submitted he heard quite by accident that another member of the craft was going to submit a tender. Well, he got "cold feet" and rang this other man up on the telephone and told him he hoped that he would not cut in on this job as he was sure of it, etc. Well, his competitor stated he was very busy and did not care whether he got the job or not and between the two it was actually agreed the one should charge a few hundred dollars more than the other. What was the result? Why the second one on the tender got the first one's price and bid over a thousand dollars lower. Now, reader, you may think number two had broken faith with tenderer number one. Well, to a certain extent such was the case, but in the first place there should have been no communication between the two parties. Here was a plain case of coercion and it is by the public finding out, such methods are adopted that the craft have come to be looked upon with suspicion. No other class of tradesmen resort to such a course and no other class are so badly liked. Still, to be honest through and through, no class are really so poorly paid for actual services rendered. The whole thing means that each man should submit his tender for the best job he knows his customer would like. Point out that you will back your job if you get your price, but have some individuality in your work. Be honest to yourself and insist on being paid for what you feel you must install so as to accomplish a first class job for your customer, but also a credit to yourself and the responsibility to your fellow-craftsmen and it is your duty to fulfill such responsibility whether he does or not. Two wrongs never made one right and never will.



POINTED EDITORIALS.

The other day the writer was watching a journeyman making a repair on a run of horizontal soil pipe. It was an old job and the fellow could not get it dry enough to pour his lead. However, after considerable trouble he got it poured and also got a few splatters of molten metal all over his arms. Now why should such an incident occur? If he had been supplied with a few pounds of lead-wool the joint would have been made in half the time. Nobody would have been burned and no "cuss words" would have been uttered.

Every shop should have a quantity of lead-wool on hand.

The writer once had a job of roughing-in before some concrete floors could be laid and it rained all the time so

"lead-wool" was brought into play. The job was done and while it cost more for the stuff, there was no cussing. No gasolene. No waiting and finally, no leaks. It has its place just the same as anything else.

* * *

When you see a sign up which reads "Estimates Free" you can rest assured that while they may be free to the party who receives them, they are not really free for the simple reason that they have cost the giver the time and trouble expended in preparing them.

If a stranger were to stop you on the street and say "here Mr.—, there's a five dollar bill." You'd say "What's this for? and would ask a thousand other questions yet this is exactly what you are doing when you hand out "Estimates Free" to the other fellow.

You are giving away the only asset you have which the landlord or bailiff cannot touch or which you cannot lose other than by giving "Estimates free."

* * *

Don't do it any more.

* * *

Discuss the topic at your association meeting.

* * *

What is that we hear? No association in your town, then write the provincial association for information as to how to form one.

* * *

Do it Now.

* * *

How many of your men use a monkey wrench to screw a valve on or off, or take the bonnet off? "Not Many" we venture to say.

* * *

One of the most particular tools in a fitter's box should be a good well-made monkey wrench.

* * *

"DON'T" use 90 degree elbows on a heating job where you can put 2 45s and a close nipple, and better still adopt the bent pipe stunt on anything less than 2 in., it pays in satisfaction if not in cents.

"DON'T" use globe valves where you can use a gate valve, but above all put the proper valve in at the right place, and for the right purpose.

"DON'T" hire a slovenly workman with a slovenly tool bag or dirty tools. He can't be neat in his work if not in himself.



CHANGE YOUR DISPLAYS.

Has it ever struck you that your display needs changing? Sanitary Engineers seem to have adopted a sameness somehow. In visiting the different places of business, you are apt to see the same display year in and year out. Even if a different fixture is put into stock, it is only placed in the same position as a former fixture. There do not seem to be enough bathrooms fitted up in our stores and showrooms.

Problems of Interest to Sanitary and Heating Engineers

Showing the Great Strides Our Municipal Bodies Are Taking to Cope with the Increased Amount of Sewers Needed.

IMPROVEMENTS AT SEWAGE DISPOSAL PLANT.

Moose Jaw.—Since early spring there have been a great many changes put into effect at the city sewage disposal plant, and now with the approach of fall everything is nearing completion, and the plant is, in the opinion of Commissioner Rundlett, who has had charge of the rebuilding, greatly increased in efficiency and much better suited to handle the immense volume of sewage than it was when the city accepted it from the contractors, William Manders & Co., a year ago.

Early this spring the roof and part of the walls of the stand-by tanks collapsed, with the result that the plant was thrown out of commission for several weeks. The ejectors, which were operated by an automatic electric switch-board were not giving satisfaction on account of the electric current and transformer, and also on account of the steady increase in the volume of the sewage. The pumping apparatus has now been changed, and in the pump house a centrifugal pump with a capacity of over 1,000 gallons per minute has been installed, and it is operated by steam carried in an underground pipe from the incinerator plant. This pump has worked most satisfactorily, and even when the sewage in the mains is increased by a large amount of rain water from the storm sewers, the plant has been capable of taking care of it. At present the plant is handling about one and a half million gallons per day, and is working satisfactorily. The ejectors are still maintained, although they are not operated as they were before.

A large sewer line is now being installed from the screen house to the river, through which the water from the storm sewers will be carried off, and it will not affect the actual sewage disposal plant as it has done in the past. The screen house is a small house built over the screen chamber; the sewage comes in through the main sewer, and the screens catch all the large articles of refuse which come through the sewer. These screens are cleaned several times every day, and the refuse taken to the incinerator plant, where it is burned.

NINETY MILES OF SEWERS.

North Toronto. There will be ninety miles of sewers and in North Toronto, Cedarvale and Moore Park.

The plans for the North Toronto sys-

tem will not be considered by the Works Committee until the Moore Park scheme has been disposed of.

Moore Park will cost as follows: Eastern section, \$88,000; western section, \$460,000.

In the construction of the huge trunk sewer to be built in Summerhill Avenue provision will be made for the sewage of the Cedarvale district.

The waste matter is to be carried down the Don Valley and emptied into Ashbridge's Bay.

Old System Inadequate.

The increase in the population of old North Toronto has been so phenomenal that the sewerage system installed two years ago is now totally inadequate. It cost over half a million dollars, and while it will not have to be "scrapped," it will have to be enlarged and extended. Also a complete new system of storm sewers will have to be laid.

The North Toronto domestic sewer system was only designed for thirty gallons per person per day, whereas the amount of sewage to be disposed of at the present time has reached ninety gallons per person per day. Some of the sewers laid in North Toronto two years ago run up-hill, recent investigations have shown.

Construction work on the Moore Park system will commence first. The scheme is divided into two sections, and until a large trunk sewer, seven feet in diameter, can be built along Summerhill Avenue, the system will have two temporary outlets, one into Glen Avenue for the eastern section, and the other into Maclellan Avenue for the western section.

Health Authorities of U.S. and Canada Will Combine Before International Waterways Commission to Prevent Water Pollution.

To secure as far as possible co-operation and unanimity before the International Waterways Commission in their recommendations respecting sewage contamination of boundary waters, Dr. J. W. S. McCullough, secretary of the Provincial Board of Health, is endeavoring to arrange a joint conference between the Canadian experts and the chief officer of the United States Health Department in the near future.

By the 15th of this month it is expected that Mr. F. A. Dallyn, who has had charge of the sanitary investigation

during the summer, will have his draft report ready for consideration. A similar investigation has been made at different points on the American side of the Great Lakes, and it is believed that the United States authorities have found the same evidences of pollution that have been discovered in the Canadian waters. A comparison of the draft reports will show where the conditions are parallel, and if the experts of both countries unite upon their recommendations, added weight will be given to the contention of the health authorities when the matter is finally laid before the International Board.

Have Both Countries Act.

The object in view is to have the Commission urge upon both the United States and Canadian Governments the necessity of securing legislative mandates that will prevent further pollution of lakes and streams that are depended upon by municipalities for water supply. It is considered by many that the existing statutes are sufficiently broad to achieve this end, but as some of the restrictions are more or less onerous, a great deal of educational work must first be done before the provisions can be enforced. This view is concurred in by Dr. Charles E. Hodgetts of the Conservation Commission. All authorities are decided that once the need for summary action is established the Federal Governments of both countries will not be wanting in action.

The conference, whenever it is arranged, will in all probability take place in Buffalo. The reports will likely be formally submitted to the Commission next month.

Medicine Hat is to have new incinerator and garbage disposal system. The interest being manifested in the work of the city Board of Health lately is of a most encouraging and gratifying nature, according to Dr. Orr, the city health officer. He says the board is entering into all new suggestions and schemes for the protection of the health of the citizens with marked enthusiasm, and the support and assistance being given him is of great value. Dr. Orr will shortly bring up the matter of the need in Medicine Hat for a modern garbage incinerator, in which the refuse of the city may be disposed of without dumping it at the nuisance ground. The latter is much too close to the city, he thinks, to be either pleasant or healthy.



The above is an illustration of a portion of the staff and employees at the H. Mueller Mfg. Co., Sarnia. Mr. Oscar B. Mueller who is resident manager as well as having charge of their New York offices, can be seen at the left.

THE H. MUELLER MFG. CO.'S FACTORY AT SARNIA, CANADA, COMPLETED.

The Canadian plant of the H. Mueller Mfg. Co., Decatur, Ill., has just been completed at Sarnia, Canada. Their new factory, which was built to take care of their large and growing trade in Canada and to save 30 per cent. duty on brass goods imported from the United States, will employ 150 men. The plant is erected on spacious ground and has excellent shipping facilities to all parts of the United States and Canada. The firm will manufacture a full line of brass goods, gas and water works supplies, tapping machines, meter testers, etc. Oscar B. Mueller, who at present has charge of the firm's New York office, and whose photo is shown at the left hand of the above illustration, will be the resident manager of the Canadian plant. He has built a beautiful home at Sarnia, and will make his home there the greater part of the time. Mr. H. Heinrichs will continue to call on the Canadian trade, filling orders from their factory there, and making his headquarters at Winnipeg. The H. Mueller Mfg. Company have adopted a new policy and have given their employees an opportunity to purchase stock in the Canadian factory at par, which has been taken advantage of by a large number of their Decatur, Ill., employees. The opening of the new factory marks a new era for the Mueller Company, who anticipate within a few years to double, if not treble their Canadian trade in brass goods.



TO TRY GAS HEATING OUTFIT IN GUELPH.

Citizens May be Encouraged to Install Service in Their Houses.

Guelph.—The Light and Heat Commission will purchase and instal in the new gas and electric light building on Huskisson street a complete gas heat-outfit. The object of this is to give the use of gas for heating a thorough trial and to find out whether it will be a feasible thing to use in private houses. After the plant is installed the general

public will be invited to look it over thoroughly, and if found satisfactory services will be installed in private houses.

That the use of gas in the city is rapidly increasing is shown by the statement for September, the receipts amounting to over \$15,000. This is a record.

Here is practically a new departure for the heating engineers of Canada. In these days of progress we should not be behind in introducing such matters. There are quite a number of firms who make a specialty of burners to be adapted to furnaces and in towns and cities where there is an abundant quantity of natural gas, this method of heating should be introduced. There is no doubt but that if gas was used instead of coal it would mean a great saving in time for the housewife, less dust, less worry and more even temperature.



STRUCK BY ELECTRIC CAR.

While Mr. A. H. Read, of the Read-Frankland Co., Ltd., Sanitary and Heating Engineers, 553 Bloor Street, Toronto, and Mr. Joseph Bell, of Messrs. Warden, King, Ltd., Toronto, were taking a trip to Eglinton in an automobile, they met with a very serious accident. Mr. Read, owner of the car, was driving the machine at the time of the accident, and was less seriously injured than his companion. He is confined to his bed from shock, while Mr. Bell is suffering from fractures of three ribs in addition to the nervous shock. They had almost cleared the tracks when the Metropolitan car, which was travelling at the rate of about 25 miles an hour, caught their machine in the side. It was crushed to the ground, and carried along the tracks for about twenty yards, with the two men in the wreckage, before the heavy car finally came to a stop. How the two men came through this experience without having their lives crushed out is a mystery. The auto was twisted out of shape, and will be a complete wreck. Unfortunately for Mr. Bell he was sitting upon the side of the motor struck by the car, and was pinned up against the frame of the machine so that he could not free himself.

SALE OF AN OLD LANDMARK.

There will pass under the hammer on November 13th, the old foundry of the Star Iron Company at Beauharnois, Que. This is one of the oldest foundries in the Province of Quebec, having been in operation since 1878. Its principal product is the "Star" boiler for hot water heating purposes. This boiler has long been a general favorite, there being, it is said, more than 6,000 of them in the city of Montreal alone, besides numbers scattered throughout the provinces of Quebec and Ontario.

The supply of grate bars and other spare parts for boilers now in use, would, it is expected, be quite a profitable business, and the foundry will doubtless realize a good price at the sale, which is to be held in Montreal.

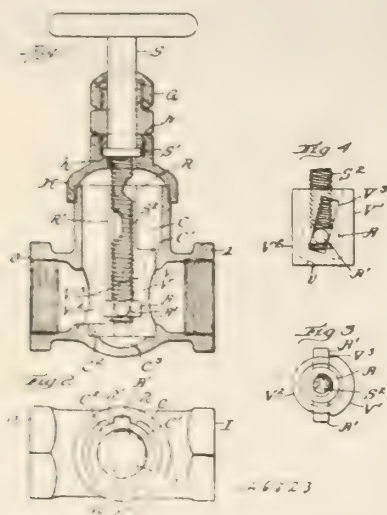


GAME FROM PRINTERS.

The sanitary engineers on the twin cities slipped it over our printer boys in a friendly game of baseball which took place some time ago. The score, although one-sided does not say that the game was. There were so many features about the game that it would take hours to write about them all, however, the principal one was made by one of the old major leaguers, Ernie McKinstry, who condescended to play with the printers in the outfield. Ernie is so fine at the game that he does not have to use his hands at the game at all he catches them on his toes, ever alert and watchful is Ernie and very few get by him, if he gets in their way.

The knights of the lead pipe were possibly the best on the field, holding down the printers, of course the printers were not in "form" and consequently were almost all the time on the "bank" or in the field. With a little practice they have a "make-up" for a good team. Saunders is a good hitter when he gets a "line" on the ball he "slugs" at it with all his might and generally makes a "miss." The plumbers "wrenched" away from the printers in the early part of the game and "lead" right through to the finish. One of them got a slight "tap" with the ball, but he "wiped his joint" and the game went on merrily as before.

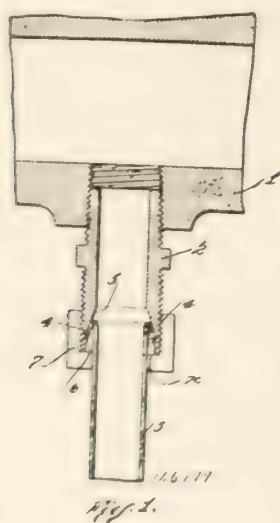
New Canadian Patents



No. 146 823. Gate Valve.

Byron C. Leavitt, Duxbury, and Paul H. Delano, Kingston, assignee of Alexander Watson, Beachmont, Massachusetts, U.S.A., 25th March, 1913; 6 years. Filed 15th January, 1913. Receipt No. 219,202.

Claim.—1. In a valve, a casing provided with a cylindrical valve seat, a cylindrical gate valve loosely fitting in the casing, the body of said cylindrical gate valve being hollow, and the sides provided with opposite inclined slots, a valve carrier within the hollow valve having arms,



No. 146,779. Pipe Joint.

The General Russell Company, New York City, assignee of Reuben R. Row, Jersey City, New Jersey, both in the U.S.A., 25th March, 1913; 6

years. Filed 10th February, 1913. Receipt No. 220,303.

Claim.—1. A joint comprising in combination a pipe, a wedge ring thereon, the end of said pipe being turned back on itself over said ring, an opposed fitting having a bevelled socket to receive said pipe end, a coupling member surrounding said pipe and engaging the rear side of said wedge ring, means for securing said coupling member to the opposed fitting comprising oppositely disposed recesses at each side, of said coupling member, said recesses being partially chamfered to form choulders at their mouths, and stud bolts having retaining nuts with bevelled faces for engaging said chamfered slots behind said shoulders and for in turn forcing the said coupling member against said wedge ring and said pipe end against said fitting.

2. A quickly detachable and replaceable pipe joint comprising a fitting having a bevelled socket, a pipe having its end turned back upon itself to form a flange having the shape of a cone frustum and being of such diameter that its forward edge, when forced into wedging engagement with the socket contents the side walls thereof intermediate the ends of the bevelled portion to form a tight packless joint, and a follower adapted to force the said forward edge lengthwise of the pipe into such wedging engagement, substantially as described.

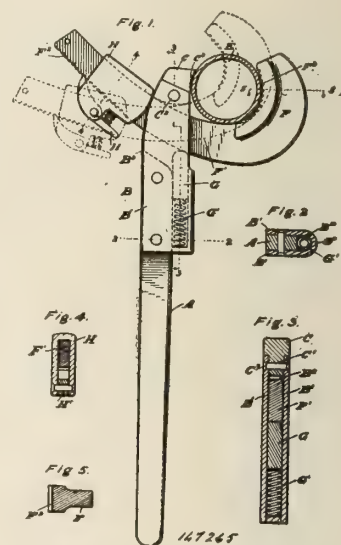
3. A quickly detachable and replaceable pipe joint, comprising a fitting having a bevelled socket, a pipe, a tubular cone frustum surrounding the pipe, the end of the pipe being turned back to embrace the cone frustum and hold it in fixed relation to the end of the pipe and being adapted upon being forced into wedging engagement with the socket to make a tight packless joint, and a follower adapted to force the turned-over end portion into wedging engagement with the socket, substantially as described.

No. 147,265.

Roland E. Sutherland and William Ming Kinsel, both of Portland, Oregon, assignees of Ernest Enderes, Littleport, Iowa, all in the U.S.A., 15th April, 1913; 6 years. Filed 7th February, 1912. Receipt No. 205,928.

Claim.—1. A pipe wrench substantially as herein described comprising a handle, a head bent from a plate of metal forming side plates lapping on

opposite sides of the handle and a bent portion uniting the said plates and forming with the handle a socket in the direction of length of the head, an opening being afforded between the said plates above the said socket for the passage of the jaw shank, a jaw carried by the head above the said shank, a movable jaw adapted to oppose that of the head and having a shank movable longitudinally in the opening in the head and provided near its extremity with ratchet teeth, an adjusting slide on the shank and having a pawl engaging its ratchet teeth, the slide being on the opposite side of the wrench head from



No. 147,265. Wrench.

the movable jaw, and a spring actuated plunger in the socket of the wrench head and engaging the movable jaw shank, all substantially as and for the purposes set forth.

2. The improvement in wrenches comprising a head having an opening for a jaw shank, a movable jaw having a shank operating in said opening, a slide on the jaw shank on the opposite side of the head from the movable jaw, and a spring actuated plunger engaging below the shank of the movable jaw, substantially as set forth.

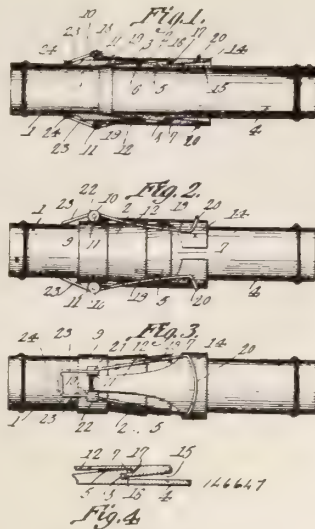
3. The combination of a wrench head having a transverse opening, a movable jaw having a shank movable longitudinally in said opening and having said shank provided on the opposite side of the head from the jaw with ratchet teeth, a slide on the jaw shank and having means engaging said teeth, and means carried by the head and pressing against said shank.

NEW CANADIAN PATENTS.

No. 146,910.

Abram W. Wheaton, Newark, New Jersey, U.S.A., 25th March, 1913; 6 years. Filed 8th January, 1913. Receipt No. 218,945.

Claim.—1. A faucet comprising a body having a threaded inlet, and a threaded outlet opening, a nozzle threaded into outlet opening and having a valve seat at its upper end, a valve adapted to seat upon said seat, means for reciprocating the valve to seat or unseat the valve, the nozzle being threaded at its lower end, an internally threaded cap to fit over the lower end of said nozzle, said cap being provided with a series of laterally extending apertured ears, a hook secured to the body, a link pivoted to the hook and provided with an aperture at its



No. 146,647. Hose Coupler.

No. 146,647.

Homer R. Cawvel, assignee of Willis J. Bellows, both of Walla Walla, Washington, U.S.A., 18th March, 1913; 6 years. Filed 14th November, 1912. Receipt No. 216,836.

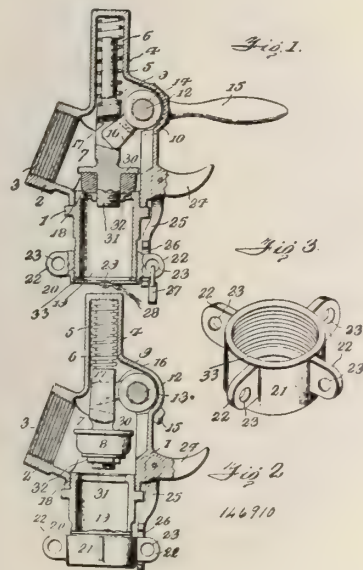
Claim.—1. In a pipe coupling, telescoped inner and outer members, a latch pivoted to one member, the latch and other member having interlocking parts extended substantially parallel to the axis of the members and detachable only upon relative longitudinal movement between the members, a resilient element interposed between the members and compressible to permit relative longitudinal movement between the members.

Claim.—1. The herein described valve, comprising an outlet for delivering a drinking bubble, a supply conduit for transmitting fluid to said outlet, and automatic means for stopping the flow through said supply conduit to said outlet, operable by such engagement with said outlet as tends to close the latter.

No. 148,854.

Louis A. Cornelius, Grand Rapids, Michigan, U.S.A., 24th June, 1913; 6 years. Filed 28th March, 1913. Receipt No. 222,465.

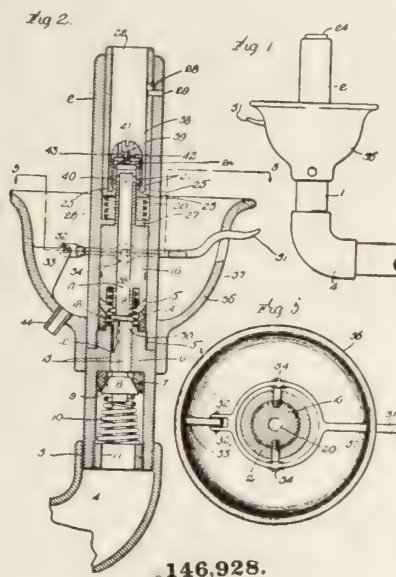
Claim.—1. In a device of the character described, a support, a horizontally disposed post fastened to the support and having an encircling cap adapted to be securely attached to the post and having a lateral recess on its under side, and a chain link adapted to enter said



No. 146,910. Faucet.

lower end adapted to embrace one or the other of the lugs on the cap, and means for locking the link to the lug.

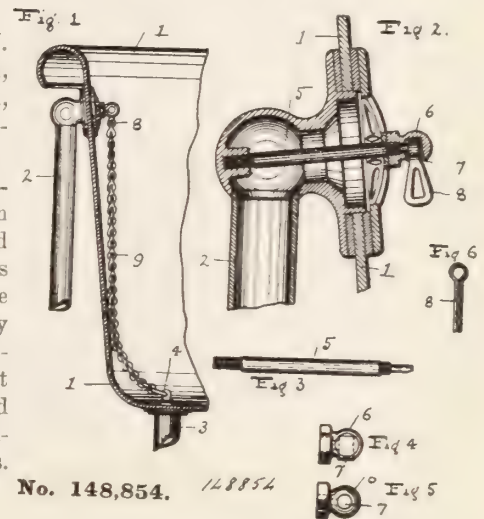
2. A faucet comprising a body having an inlet opening and outlet opening, a nozzle threaded into the outlet opening, said nozzle being threaded externally at its lower end and provided with a valve seat at its upper end, a spring-pressed valve in said body, a laterally extending shaft provided with an arm adapted to engage the shank of the valve to raise the same against the influence of the spring, a hook integral with the valve body, a link pivoted to said hook and having an elongated aperture in the lower part thereof, and an internally threaded cap adapted to fit over the nozzle, said cap being provided with a series of laterally extending lugs, each adapted to be embraced in the aperture of the link, and means for locking the link to the lug.



No. 146,928. Valve for Drinking Fountains.

No. 146,928.

Joseph D. Ramsey, Dorchester, Massachusetts, U.S.A., 25th March, 1913; 6 years. Filed 12th February, 1913; Receipt No. 220,382.



No. 148,854.

Chain Post for Baths.

recess and to encircle the post in the attached position of the cap.

2. In a device of the character described, a post having a screw cap threaded thereon provided with a lateral recess and chain link adapted to enter said recess and to encircle the post in the screwed on position of the cap.

3. In a device of the character described, a support, a post threaded at one end on the support, a lock nut for said threaded connection and threaded on the post at the opposite end and provided with a lateral recess, and a chain link adapted to enter said recess and to encircle the post in the screwed on position of the cap.

Hamilton, Ont.—The Tallman Brass Mfg. Co., Hamilton, have purchased the plant and machinery of Messrs. Lomas & Nelson, art metal and electric fixture manufacturers, and will make electric and gas fixtures of their own design.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



TANK TELL-TALE.

Editor Sanitary Engineer,—

A few days ago I was called upon by a farmer who is going to instal plumbing in his home. He has a lake some distance away from which he is able to water his cattle, etc., and he wishes to put a tank into the attic of his house to supply his plumbing fixtures all he will have to do is turn on a valve to fill this tank but he wants me to put a tell-tale pipe in something after the style of a small overflow.

I do not want to do this in my contract if possible and would like you to tell me if it is possible to put in an electric alarm. My reason is this:

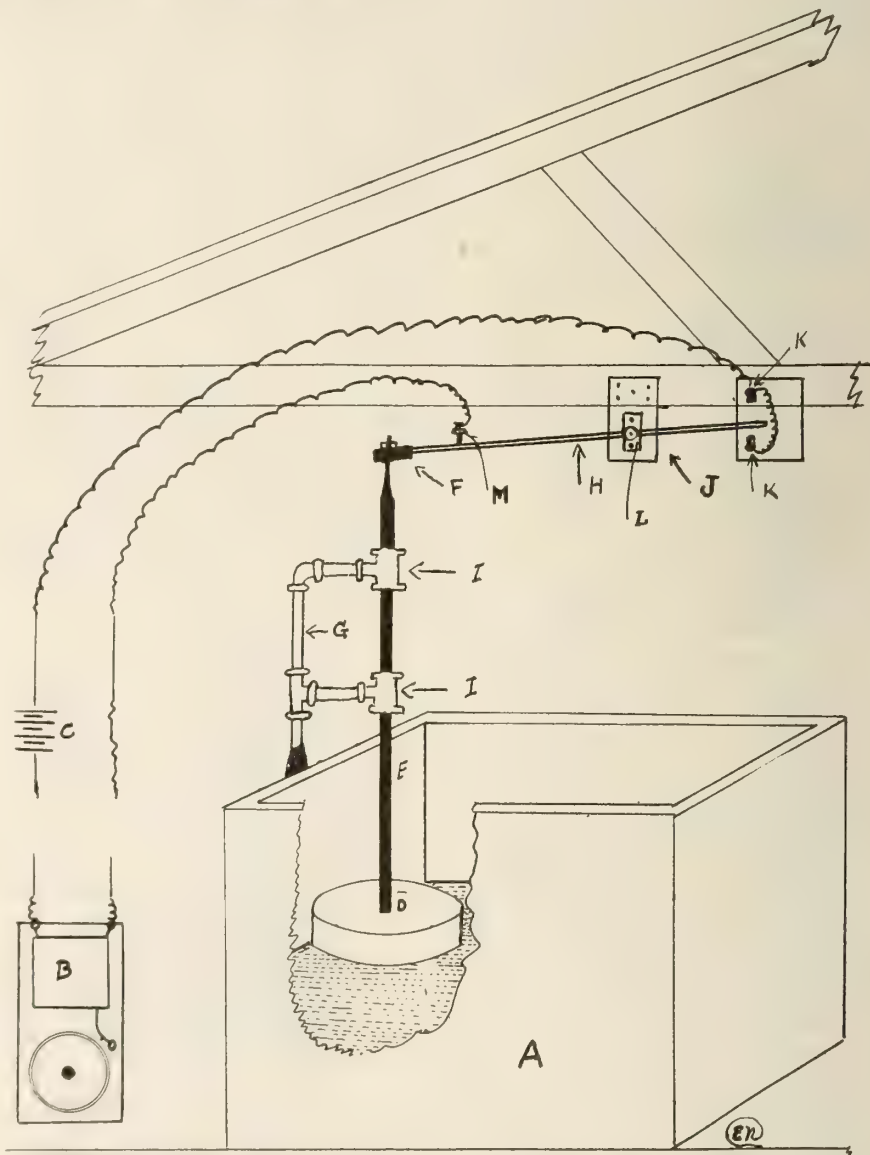
An overflow would only tell him when his water was too high in the tank, but would be no use when the water got too low and I want a contrivance which will operate both when the water is too high or too low by replying in your next issue you will oblige,—

A Constant Reader.

The writer was up against just such a problem a few years ago and worked out this little apparatus himself shown in Fig. 1. At that time it was the first job of the kind he had been asked to do. The farmer had a lake supply just the same. This contrivance worked splendidly and is working yet. It is made up of $\frac{3}{8}$ pipe and fittings with two dry batteries. The bell is placed in the kitchen or at any convenient place near to the location of the supply valve, the float is made of tinned copper with a strong spindle. The following explanation will simplify matters, viz., A is the tank. B is the electric bell and should be placed near the supply valve. C denotes the batteries which may be placed in the same room as the bells or up near the tank D is the float, the one the writer made was 8 inches in diameter and 3 inches deep and made of tinned copper. E is the float rod made of a piece of $\frac{1}{4}$ inch iron pipe size brass pipe, to make the connection between the top and the rod, the inside was tapped to $\frac{1}{4}$ in. machine thread and a piece of solid rod screwed into the pipe and sweated together and a long thread cut on the rod. 2 nuts were put on this

rod. F is a piece of pressed paper fibre with an oblong hole in it so that rod E may pass through it loosely. This fibre is bolted on the lever H so as to insulate the current from the other portion of

lever and is cut any length desired, I is two $\frac{3}{8}$ in. tees, the threads should be filed out almost away and the rod should be well greased. There should be lots of grease, not oil, on this rod E. J is a



Simple Control for Country Residence Supply Tank.

the apparatus. G is the bracket or holder and is made of $\frac{3}{8}$ in. iron pipe and fittings. The portion which forms the support is heated at the lower end and flattened out, thus enabling it to be screwed to the side of tank. H is the

piece of board cut any desired length and nailed up so as to make a support for plate and escutcheon pin L. K is the two contact points. M is a small binding post to make the other connection necessary.

AN EXPERT INSTRUCTOR.

Professor Arthur Bateman, Director of the Anglo-American Correspondence College, is in every sense of the word, a born sanitary engineer, his father being a successful master plumber in the North of England, of over forty years' standing.

Working all day for his father, and attending the technical colleges at night, Prof. Bateman, at the early age of twenty, obtained first-class honors, in theoretical and practical plumbing, also his registration certificates. Following these successes, he was appointed head of the Sanitary Engineering and Plumbing Department, in the Middlesbrough Technical College, holding this position with distinction, for seven years, dur-



PROF. ARTHUR BATEMAN.

ing which time he qualified as a sanitary inspector, sanitary engineer, and certified teacher, being awarded diplomas for practical sanitation, sanitary science, hygiene, and sanitary engineering.

Whilst only twenty-two, he was made head of the sanitary department of the Northern Correspondence College, which he conducted along with his other duties, with similar success.

As was only natural to a young man, who had distinguished himself, in his profession, so early in life, he longed for wider scope, so in 1912, he obtained a three months' vacation, and came to the United States, took up his tools again, and worked as a journeyman, in Utica and Long Lake West, New York. The social and financial conditions, with which he met, soon prompted him to resign his English appointments, and accept the position as chief of the plumbing and sanitary engineering, at the National Trade Schools, Chicago. Be-

lieving that the opportunity existed for the foundation of a college of correspondence, he opened an institution, where the ambitious could obtain a knowledge of the theory and science, underlying the ancient art and craft of plumbing and sanitary engineering, to enable them to pass the States and Trade Union examination, and to qualify for sanitary inspectors, plumbing inspectors, sanitary engineers, etc. His efforts so far have been eminently successful.

Prof. Bateman, has for many years, been a contributor to the various trade journals, but it is as a teacher and lecturer he excels.

**CHANGE HOT WATER SYSTEM TO STEAM.**

Editor Sanitary Engineer,—

Would you please inform me if it is possible to change a hot water heating system into a steam system to be heated from a boiler which runs a factory 100 ft. from the house. The present system is an ordinary two pipe open system of about 600 ft. radiation. The steam pipes would have to run underground. Hoping to hear from you at an early date.

Subscriber.

In answer to "subscriber" we may state the information given is not very clear. We would require to know the pressure carried constantly at the boiler in the factory, the height of the water line maintained at the boiler and the height of the lowest radiator in the house where the proposed change is required to be made. Therefore to answer Subscriber properly we should really need to have an elevation plan of the two buildings.—Editor.

**SANITARY FOUNTAINS IN FACTORY.**

Editor, Sanitary Engineer,—

The owner of a large building is anxious to install sanitary drinking fountains. He has a number of lavatories on each floor which have only one opening where the cold water faucet is attached. There is an additional hole where a hot water faucet could be put. The piping is arranged as per sketch. Can a bubbling fountain be installed in some way so as to be both serviceable, practical and not too costly. By replying in your next issue you will oblige.

A Sanitary Engineer.

Fig. 1 is drawing as submitted by our enquirer "A Sanitary Engineer" and shows an ordinary lavatory basin with one tap in use only and by the way the water supply is fitted we would presume it to be a self-closing faucet from

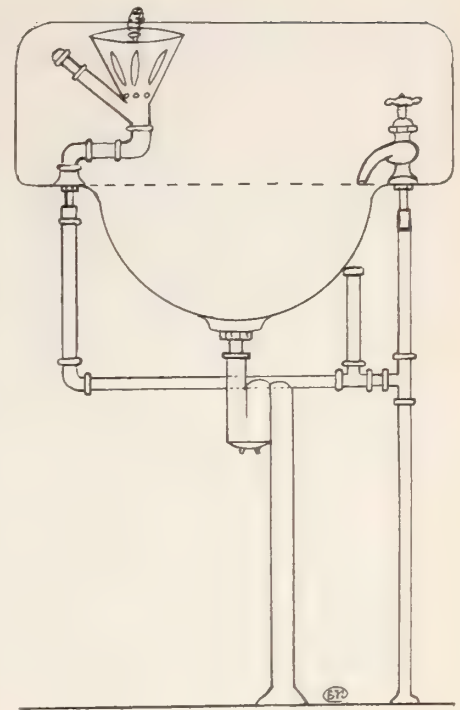


Fig. 1.

the very fact that a piece of pipe is attached to the water supply which forms an air chamber and acts as a cushion, this method in itself is very good practice as it prevents water hammer. Fig. 2 is a drawing showing how our inquirer can instal a sanitary drinking fountain which operates by pressing down

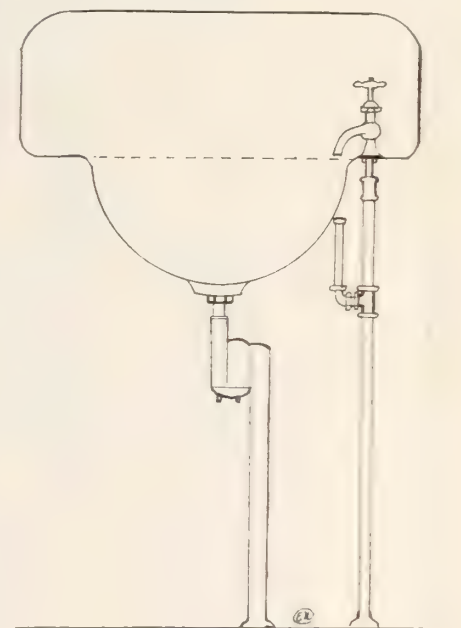


Fig. 2.

the valve shown on the side of the fixture. This method will do away with the necessity of having to fit up a waste pipe and connecting same to the drain. It is intended to have the offset made long enough so as to allow the drip to flow into the basin.—Editor.

Complete Course of Sheet Metal Work

By L. W. KOSER

On plate 36 we show how to develop take for example a window cap or Pediment.

Fig. 1 shows an elevation of this pediment with the moulding running up the front and returning or going back to the wall line at the top and bottom. This style is generally referred to as a broken pediment.

The example is to develop the "raked" profiles for the top and bottom mitres of a broken pediment.

The necessity for changing the profile in order to form a mitre will be more clearly understood by referring to fig. 2, in which the sections V-X and S represent the three parts of the

moulding, V being the bottom return, which would go back to the wall at A-X, representing the slanting face, and S the top. In this figure each of the sections are the same face width, but it is noticed that they do not match at the joining lines or mitres. It then becomes necessary to modify or change at least two of them in order to make them match. This is called raking the profiles and constitutes the example.

First draw the line R-S, fig. 3, at the desired pitch, and at right angles to it draw the line Y-Z, on which draw the normal profile C.

Divide this off into equal parts as you would do in developing a square

mitre, numbering each point, and draw lines through each point, letting them run indefinitely on each side.

At any place to the left of the normal profile and above it draw the line Y-Z, fig. 4, on which erect a normal profile C, with its parts divided the same.

Drop lines from each of these points until they intersect corresponding lines from profile C, fig. 3. Draw a line through the points of intersection, which will give the raked profile for the bottom. In the same manner erect a normal profile at the right of fig. 3 as shown by fig. 5, and lines dropped from this to the corresponding lines from C,

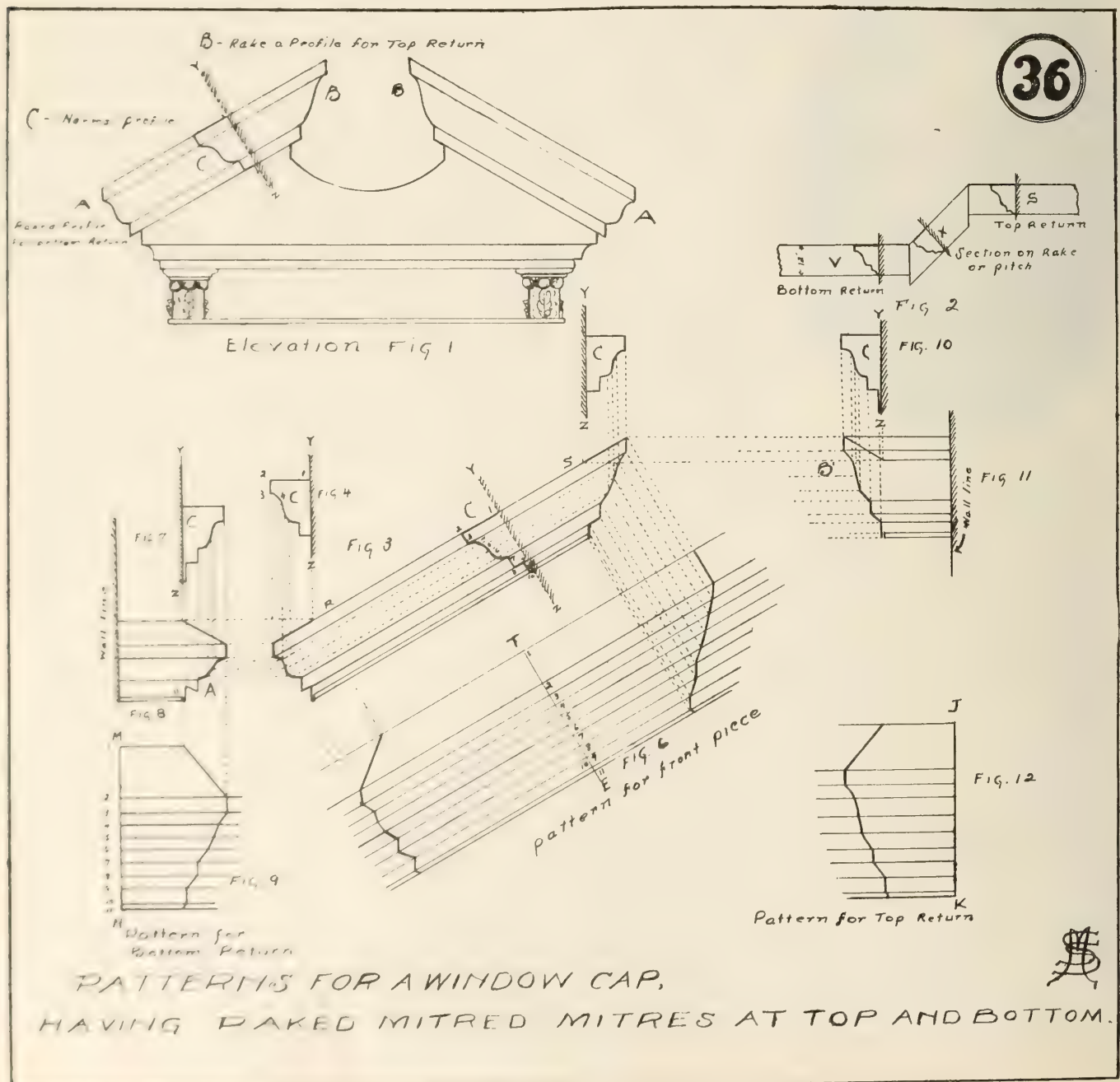


fig. 3, gives the raked profile for the top B.

At right angles to R-S, fig. 3, draw the line T-E, fig. 6, on which lay out the stretchout of the profile C. Project the measuring lines on each side and carry lines at right angles to R-S from each point of the top and bottom raked profiles until they intersect with corresponding lines, and this gives the pattern for the front.

Form to the shape of the normal profile C.

To get the mitres for the return piece at the bottom draw the normal profile at 7 as shown and drop lines from each point which intersects with horizontal lines carried from the bottom raked profile. Trace a line through the points of intersection and make the

length of this piece the desired length to return to the wall line.

Draw the line M-N, on which lay off the stretchout of the profile. Draw the measurement lines and drop lines from each of the points of profile A' until they intersect the corresponding lines. Form this piece to the shape of the bottom raked profile A'.

To get the pattern for the top return proceed in the same manner.

Draw the normal profile C at fig. 10 and develop the raked profile B', fig. 11, below which lay out a stretchout of B', and develop the pattern.

Form this piece to the shape of B'.

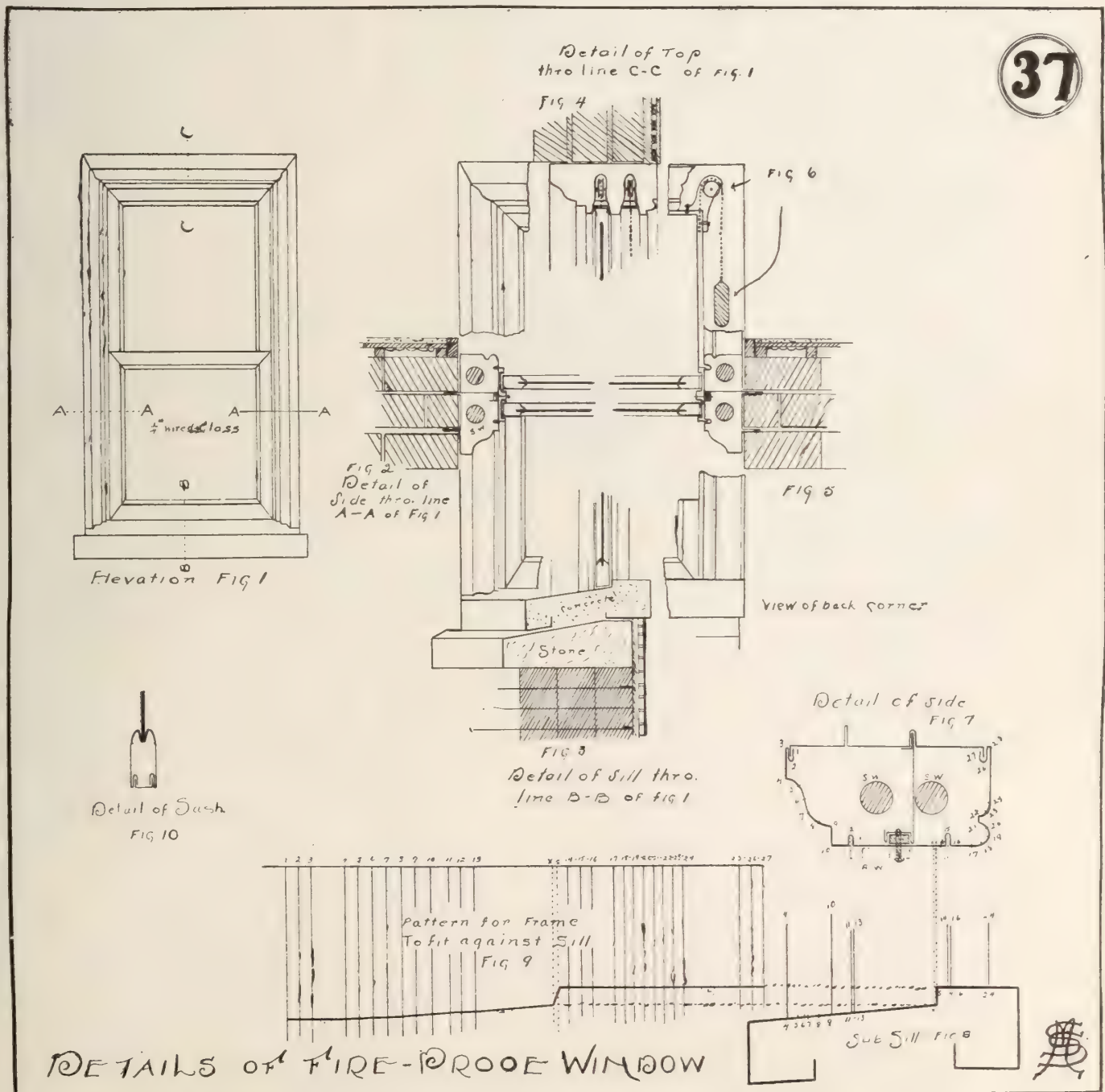
On plate 37 we show in detail a fire-proof sheet metal window. These windows are now being made in every large sheet metal factory, and are considered

at present the highest art of the sheet metal worker, and, in fact, it is this class of architectural work, such as cornices made from architect's details, possessing all the beautiful lines and proportions of the classic order; fire-proof windows and skylights, with hollow mouldings and expanding bars, possessing all the requisites of modern steel structure engineering, that has raised the work of the sheet metal worker from that of the lowly tinker to the more dignified one of the artist artisan.

Now let us study these window details.

Fig. 1 shows an elevation of a window resembling very much the usual wooden window; in fact, the fireproof window

(Continued in next issue.)





THREE MILES OF SEWERS FOR BERLIN.

The town of Berlin, Ont., is having about three miles of new sewer pipes laid. They are a fine sample of cement pipes, a view of some which are being laid will be seen above. They have a fine set of sanitary by-laws and as a whole the town seems to be alive to the necessity of good sanitary engineering.

NEAT STORE AT SARNIA.

Alex. Joss of Sarnia, Ont., keeps a very nice and neat establishment. He believes in keeping his brass and nickel-plated goods in first-class shape, as is evidenced by the fact that all these goods are kept in drawers which will be seen by looking at above illustration of the interior of Mr. Joss's store.

Another novel feature in this establishment is the layout of the window which resembles a large glass case, viz., the whole is a glass enclosure with the window front forming part of the enclosure. In this way the display can be seen to advantage, the store is not darkened and the goods are always free from dust. One can simply open a glass door and walk in amongst the goods, just as if it was a separate show-room.

Mr. Foss is a Scotchman by birth and one of the most successful sanitary engineers in Sarnia. He has great hopes for his adopted city and the people as a whole feel when they trust their work to Alex. Joss that they will get a square deal.

KILDONAN MUNICIPALITY TO HAVE WATERWORKS.

Engineer Parr Instructed by Council to Prepare Plans for System.

Engineer Parr, of Kildonan, was instructed by the council at the meeting yesterday to prepare plans for a system of waterworks and sewers for the entire municipality. This work will involve the employment of a consulting engineer.

An application made for a sewer on Oakview avenue was referred to Engin-

eer Parr for a report. The building by-law became effective July 8, and since that time permits totalling 154,200 have been issued. Thirty-two permits were issued in August, with a valuation of \$31,830.

By-laws for lighting and drainage and plumbing were referred to the engineer for report.

Hamilton Plans Overflow Sewers.

Plans for a system of overflow sewers designed to relieve the flooding which occurs during times of heavy rainfall were passed at a special meeting of the Board of Works to-night. It is estimated that the system will cost in the neighborhood of \$650,000. It is intended to discharge this storm water into the Bay, it being practically impossible to treat it, but the discharge will be of such a diluted nature that no harm can come from it.

Mayor Allan explained that City Engineer MacAllum was busy with the Railway Commission, and had a good excuse for not being present.

"Mr. Hollingsworth is fully conversant with this scheme," said Ald. Willobby Ellis. "And has given us more information on it to-night than we have ever had before."

Ald. Wm. Birrell said that the Assistant City Engineer was far more conversant with this matter than the City Engineer.

Ald. Ryan attributed these attacks to politics and said he supposed the reason they were made was because the elections were coming on. He moved that the meeting adjourn until some date, as there did not appear to be any likelihood of the work in hand being accomplished. Just when the chairman was on the point of declaring the meeting adjourned the dove of peace descended on the proceedings and the Assistant City Engineer was permitted to proceed with his explanations.

Two plans were submitted to the board to relieve the flooding but one of them

was discarded because it was not sufficiently comprehensive. This was what was known as "Scheme A," and was designed to relieve the flooding in that portion of the city between Hess Street on the west and Victoria Avenue on the east, draining an area of 744 acres. This plan would have relieved only seventy per cent. of the cases while the scheme accepted will relieve the flooding in ninety-five per cent. of the cases.

The accepted scheme is known as "Scheme B," extending from Hess street on the west to Sherman Avenue on the east, saving an outfall on Wentworth Street, and draining an area of 1,382 acres.

Editor's Note.—It is very interesting to note that Hamilton intends adopting a storm drainage system. There are quite a number of smaller towns, we understand, who find their sewage filtration plant far too small for the simple reason that they allow all their storm water to enter their filtration plant.

These storm drainage schemes will, however, involve the necessity of taking care that no matter tending to pollution of our drinking water shall find its way into streams which are our water supplies or the supply of other towns down or along the same water way.

This being a sanitary measure we feel it is within our province to comment upon it and we wish to see more of our sanitary engineers voicing their sentiments on sewage disposal methods. This storm drain question is only one more added to the many which the sanitary engineer will be expected to handle in the near future.

The street drainage and sewerage systems have been largely under the supervision of civil engineers. But now that universities see the necessity of enlarging the scope for study in matters of sanitation we feel sure these questions as well as the question of our water supplies will be placed in the hands of our future craftsmen "Sanitary Engineers."

Quality is King

A Word About the Buyer Showing that Good Goods Will of Themselves Command Good Prices, and That There Are Slick Buyers as Well as Slick Salesmen—That Quality Speaks Louder Than Price Every Time.

By HARRY GALE NYE.

THE man who successfully snatches from the fire of business a choice morsel or a prize worth the risk, immediately chortles in his glee, and forthwith tells his friends of his killing. The man who gets on the right side of the wheat market and lines his pockets with easily earned spondulicks never fails to tell a friend in the village about his good luck, always warning the friend, of course, to keep the matter sub-rosa! But the man who fails to get the morsel from the fire and burns his fingers, and the man who loses his money and has to soak his wife's jewels after a transaction in the wheat pit, seldom tells about it. We always hear of the triumphs, but most of the failures go into the discard without making sufficient noise to be noticed.

It is frequently thus with the slick salesman who meets a smooth buyer. We hear every place the stories of the slick salesman. Most of the popular articles in many of the big magazines to-day are devoted to telling and explaining slick deals pulled off by cracker-jack salesmen,—but whoever heard of the slick buyer? In the hotels we sit about and hear the foxy traveling man telling how he put it over the old tack-head who runs the department store out in Schuylerville,—and also how much smoother he was than Old Man Price, in Hickory Hollow, but every little while one of these wise-guy salesmen meets up with a real owl out in the country district, and when he does, he forgets to mention it when he gets back to the hotel. ,

I have had several years of road experience myself and I know what I am talking about. Now, it is absolutely essential for a salesman to have confidence in himself. I wouldn't have a salesman traveling for me who didn't think he was smart, and if he encourages himself any by whistling and chanting his triumphs, let him chant. This little preachment isn't intended to disparage the slickness of the slick salesman. It is merely apropos of the fact that it is not always "raining in London." Sometimes the sun shines there and sometimes the uncouth, rough country plumber or country store buyer is about as smooth a proposition as there is out of jail.

During my own experience, I have run across a few stunts on the part of

the buyers that have made me sit up and take notice, and once in my young days I ran up against a buyer for a small department store, who looked to me like a regular lolly-pop lobster. In fact I was wondering why in the world his house kept him. He bought free and easy and made me think I was the "real goods," but when I got back to the hotel that night and got to looking carefully through the contract I had signed up with him, I found I had been handed one large and juicy lemon, and what's more, that old Hay-seed made my house live up to the very last letter of that contract. He taught me a few things that I will never forget as long



Harry G. Nye.

as I live, the principle of which is to never under-estimate the ability of a buyer.

The real estate man who brings in all sorts of imaginary customers for the land you are seeking to buy, isn't in it with the country merchant who is about to transfer his account from Jones & Co. to your house, providing you will come across with an extra 5 per cent. discount. And the next time you call you find that he has transferred his account from your house to Bixby Supply Co., and has profited by both transactions!

However, the days when the profit on a line of goods depended upon the ability of the salesman to get a high price are rapidly drawing to a close. Manufacturers everywhere are learning that the successful way to do business is to first make high quality goods and secondly to have a fixed and established resale price, treating everyone alike.

The moral is that it pays to have a fair price and to maintain it, that special prices to open new business generally fail to produce a profit. The only way to get business is to make an article or to sell an article that is better than that of your competitors.

Too many business men have each other by the throats cutting prices, who can't get the idea into their heads that they could make more money and get more business if they would spend their energy striving to produce a better article. Any man knows that a good pair of shoes at \$4.00 will sell better than a poor one at the same price, and there are a good many people in this world wise enough to know that it pays to put \$6.00 into a pair of shoes rather than \$3.00, because the six dollar shoes will outwear two pairs of the three dollar shoes, and throw in a liberal allowance for comfort and satisfaction.

There is no truer axiom than this:

"It pays to buy the best."

And if it pays to buy the best, you may bet your bottom dollar that it pays to make the best. The man who makes a better article than his fellows has the call no matter what the price. But you must actually have the better article, because you can't run a shady article on the public and keep it up. When you say you are producing a better article than your rival and people buy it on your say so, the product must stand the test. It must be better.

When the quality of a salesman's samples is better than that of his rival's and when the goods sent out are as good as the samples, then the slick salesman will not have to resort to smooth tactics to open new business and the firm will have no difficulty in holding business when it is secured. The foxy merchant who tries to outdo the salesman in slickness will have to seek other fields for his talent, for quality will out-sell other goods at a fixed price and need not be hawked about to find ready customers.

TRADE NOTES.

Messrs. R. Bigley Co., Ltd., Macdonell Ave., Parkdale, Toronto, suffered considerable loss by fire in their foundry. They are the manufacturers and inventors of the Bigley heater known so well throughout Canada.

SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, NOVEMBER 1, 1913

No. 20

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*

(ESTABLISHED 1888)

H. T. HUNTER, *General Manager*

SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

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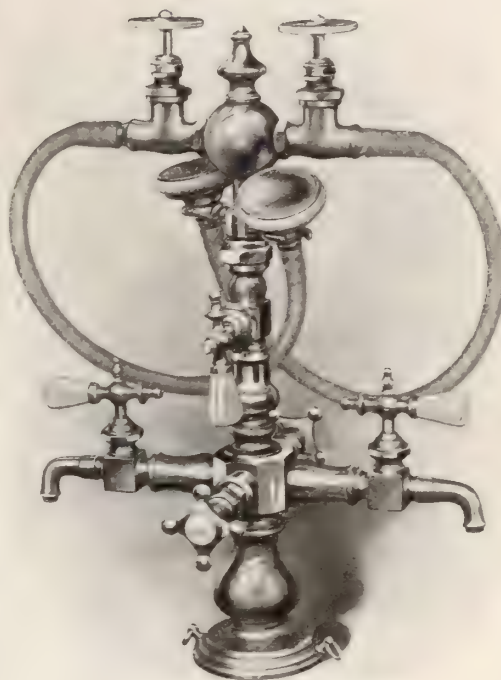
Published on 1st and 15th of each month. Subscription, Canada, \$1.00; United States, \$1.50; Great Britain and the Colonies, 4s. 6d.; Elsewhere, 6s..

Cable Address: Macpubco, Toronto; Atabek, London, England

A Very Complete Fixture For The Up-To-Date Barber Establishment



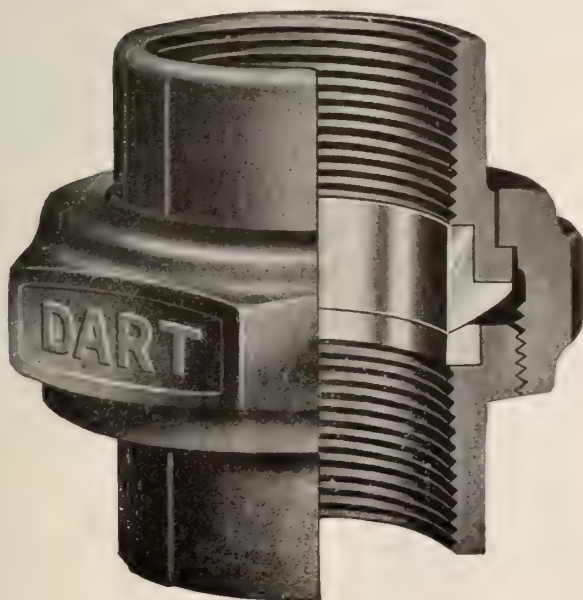
Cut on right illustrates our J. M. T. Combination Double Basin and Shampoo Cock, with Cushion Compression Supply Valves, Fuller Basin and Shampoo Cocks, all China-Indexed Handles, complete with Tube and Sprinklets having Rubber Ring Protectors.



The James Morrison Brass Mfg. Co., Limited
93-97 Adelaide Street West, Toronto

BRONZE to Bronze at the joint

Bronze, you know, will not rust or corrode. That's why Dart unions do not leak. The heavy iron ends and nut will not stretch.



The ball-shaped seat permits the union to be connected whether pipes are in or out of line.

Nor are Dart unions affected by expansion contraction or vibration. The connections made with Dart unions stay tight until deliberately loosened, then the union is just as good to use as when new.

BUY THEM FROM YOUR JOBBER

Dart Union Co., Limited
Toronto - - Ontario

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Silent Influence

¶ Let us take a peach stone and drop it in the earth. We watch the soil with growing impatience for weeks and yet remain unrewarded with any appearance of life. We tire and forget.

¶ Nature, however, is infinitely patient, and in due time a sturdy tree blossoms and bears fruit on the spot where our hopes shrivelled up and died.

¶ It's the same way with advertising. There are some men who dig up their peach stone before it has had time to sprout. They fail to observe the silent growth, the hidden work and the subtle influence of the mighty force they have set in motion.

¶ They do not recognize the occasional inquiry as being simply the outward evidence of a potent work beneath the surface. It takes something more than a superficial examination to reveal the fact that the producing of inquiries is advertising's least important function.

¶ Let us be careful and unprejudiced in our analysis and we will discover and value at its true worth the real work that advertising performs—the standardizing of our name—the establishing of confidence in our product—the cementing of connection and the simplifying and minimizing of our salesmen's work. Then, instead of criticizing advertising we would do all we could to make its work more effective.

¶ An advertiser said to us a few months ago—"I simply haven't any time to devote to writing advertisements."

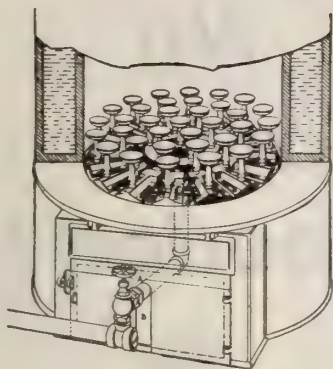
¶ "What takes up your time?" we asked.

¶ "Oh, correspondence and detail work," he said.

¶ "Listen," we said. "Correspondence is important, and detail necessary, but your advertising is more important and necessary than either. Unless your advertising is good it creates an unfavorable or negative impression, and you cannot afford that. If you make it good it will be the most effective agency you could possibly employ. It would pay you to take an hour or, if necessary, a day, once a month, to write your advertising."

¶ This advertiser took our advice, and is now reaping the benefit of it. Several good inquiries have been received, but this manufacturer emphatically states that it is the general effect of his advertising that has impressed him most. His salesmen all report favorably and state that the advertising is being read and referred to in their interviews with prospective customers.

¶ Take that old doubt and pessimism about advertising and file it to come up a year hence. Help your advertising along, study it, spend a little more time and money on it and at the end of a year when your old doubt and pessimism is laid on your desk you'll blush in shame and slam it in the waste basket.



Many years of continuous manufacture and the installation of the "STANDARD" GAS SAVING BURNERS in all makes of Steam and Hot Water Heating Boilers and Hot Air Furnaces makes it possible for us to obtain the best results in quantity of heat obtained for the amount of gas consumed.

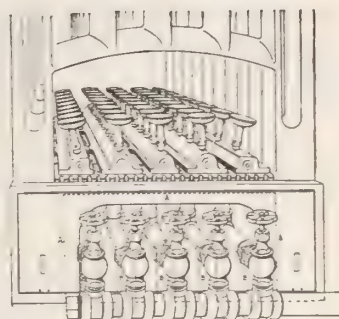
"STANDARD" Gas Saving Burners are also especially adapted for automatic regulation of temperature, and easily controlled by hand regulation.

The "STANDARD" GAS SAVING BURNERS are durable and reliable.

STANDARD HEATING & RADIATOR CO.

MANUFACTURERS

Cor. Penn Ave. and Third St., Pittsburgh, Pa.



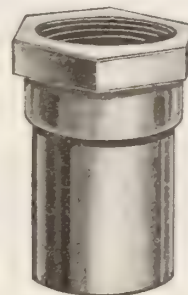
SEND US
A SAMPLE
ORDER



MALE THREAD

We Manufacture "Imperial" Soldering Nipples of Quality

One trial will convince you
that we make the best nipples
you ever saw



FEMALE THREAD

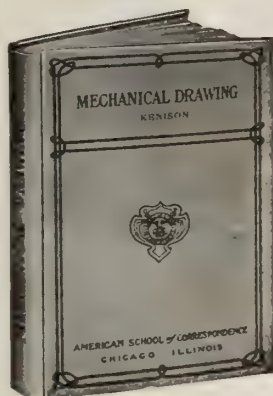
WE MAKE
THE BEST
ONLY

THE CANADA METAL CO., LIMITED

FRASER AVENUE TORONTO

50 BRENNAN STREET MONTREAL

301 CHAMBERS STREET WINNIPEG



Mechanical Drawing

By Ervin Kenison, S.B.

Instructor in Mechanical Drawing, Massachusetts Institute of Technology

176 pp., 140 illus. Cloth binding. Gives a course of practical instruction in the art of Mechanical Drawing, based on methods that have stood the test of years of experience. Includes orthographic, isometric and oblique projections, shade lines, intersections and developments, lettering, etc., with abundant exercises and plates.

Price, \$1.00

MacLean Publishing Co.

Technical Book Dept.

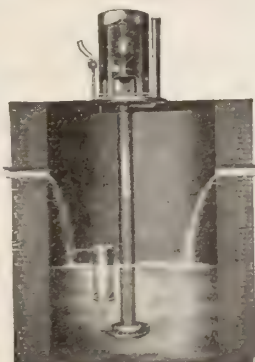
143-149 University Ave., Toronto

"ECONOMY" SEWAGE EJECTORS SINGLE AND DUPLEX UNITS

will automatically EJECT any QUANTITY of Sewage at any HEAD. They are adapted for MUNICIPAL DISPOSAL PLANTS and CITY BUILDINGS. The ECONOMY may be operated by ELECTRICITY, STEAM or GAS ENGINE.

Write for information on THE ECONOMY DUPLEX DRY PUMP CHAMBER EJECTOR and for the ECONOMY CATALOG.

Canadian Distributors: Francis Hankin & Co., Mail Bldg., Toronto, Ont.; Coristine Bldg., Montreal, Que.; Notzel Engineering & Supply Co., Duncan Bldg., Vancouver, B.C.; J. A. McTaggart, Travelers Bldg., Winnipeg, Man.



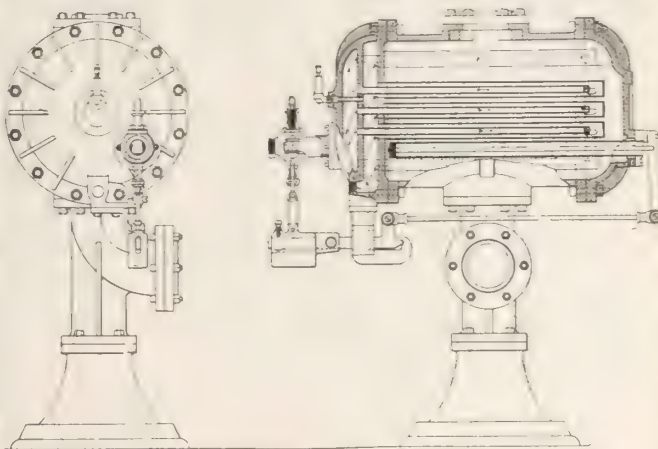
Automatic Electric Bilge Pump
Manufacturers
Carpenter St., Chicago, Ill.

THOMAS & SMITH, Inc., 116-118 N. Carpenter St., Chicago, Ill.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

The "Manny" Heater

Affords Every Aggressive Steamfitter An
Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water furnace, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room through underground pipes.

There isn't a better or more economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of tubes—Threaded Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

The E. S. Manny Co., Montreal

Condensed or "Want" Ads.**SITUATION VACANT**

WANTED—A PLUMBER, A TINSMITH AND
a hardware clerk. Cameron & Leacock, Smith's
Falls, Ont. (171f)

WANTED — ONE FIRST-CLASS STEADY
plumber for Eastern Canada. Permanent job
for right man. Apply to Box 42, Sanitary
Engineer, Toronto. (22)

GOOD OPPORTUNITY

PLUMBING, TINSMITHING, STOVE AND
Hardware Business for sale, in Grimsby Vil-
lage. Apply 752 King Street East, Hamilton,
Ont. (19)

**UNDER THE
WINDING-UP ACT
IN RE THE**

**Star Iron Company
LIMITED
IN LIQUIDATION
Foundry of 30 Tons Daily, Capacity
FOR SALE AT AUCTION**

The undersigned will sell at their
rooms, 69 St. James Street, Montreal,
on Thursday,

November 13th, 1913, at 11 a.m.

the assets of the above estate as

Grounds, buildings, machinery,
patterns, moulds and plant with
rights in water power and leases,
situated at Beauharnois, P. Q.

The patterns and moulds com-
prise:

A. Patterns and moulds for the
"New Star Boiler" from No. 0 to
No. 10, and all connections.

B. Patterns and moulds for the
"Canada Improved" Radiators, 20 to
45 inches, plain and ornamented.

C. Patterns and moulds for Soil
Pipe and soil pipe fittings in sizes
2-in., 4-in. and 6-inch, in light,
medium and extra heavy.

D. Patterns and brass moulds for
full assortment of the "Star" steam
fittings.

The whole of the above to be sold
en bloc, the purchaser to buy at
cost price all material and goods
manufactured, both at Beauharnois
and at the warehouse, 1355 Cadieux
Street, Montreal, consisting princi-
pally of "Star" Hot Water Boilers,
parts and repairs.

Of the Star Boilers, there are in
actual operation 15,000. This should
justify good and profitable results
in the sale of parts and repairs.

All information may be had, and
the factory can be seen in operation
by addressing the Liquidator.

**MARCOTTE BROS.
AUCTIONEERS**

**ALEXANDER DESMARTEAU
LIQUIDATOR
60 NOTRE DAME ST. EAST
MONTREAL**

STUDY**These Uncrowded Professions**

Sanitary Science and Engineering,
Sanitary Inspectorship, The Science
of Plumbing, Hygiene, under the
directorship of Prof. Arthur Bate-
man, M. Inst. S.E., A. R. San. I.,
M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

**Anglo-American Sanitary Corres-
pondence College, 10-12 W. Ontario
St., Chicago, Ill.**

WANTED**Heating and Plumbing Traveller**

for Western Canada. Splendid
opportunity for right man. Ap-
ply stating age, experience, sal-
ary and references to Box 100,
Sanitary Engineer, 34 Royal
Bank, Winnipeg, Man.

**SYPHONS
FOR
SEPTIC TANKS**

**WATSON AND PAUL
93 St. Genevieve Street, Montreal**



**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE

BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

**BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO**

WRITE FOR CATALOG

**No
other
needed!**



A Williams' "Agrippa" Chain
Wrench will assuredly save your
buying and carrying an extra tool
because of its universal adaptation
to both pipe and fittings work.

The close-to-the-ceiling and the
pinched-for-space propositions are
all "meat" for the Williams'
"Agrippa" single jaw.

If you had but one dollar to spend
and an endless number of tools to
choose from, you could not "go
wrong" on a Williams' "Agrippa."
An "Agrippa" will do everything
that is possible with any other sort
of pipe wrench and much more.

The reliability, both for strength
and service, is established before it
goes to you—We prove it by test,
and the price is in your favor, too.

Go to your dealer for tools on trial.
Return 'em if not as represented.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City

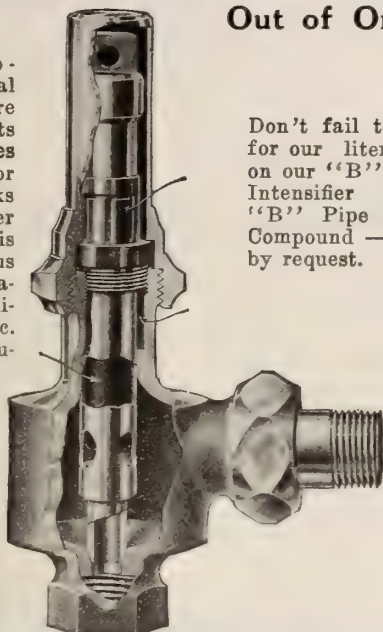
40 So. Clinton St., Chicago, Ill.

NATIONAL VALVES

Are Ordered and Reordered
—Never Get Out of Order

National Thermo-static is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent.

More merits about the valve by writing for more information.

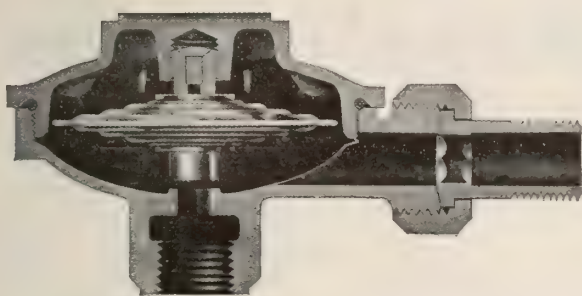


Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

NATIONAL STEAM SPECIALTY CO.

24-26 S. Clinton Street, CHICAGO
Surplus, Dunn & Co., 74 Murray Street, NEW YORK
L. N. Vanstone, 8 Wellington St. East, Toronto. Moncrieff & Endress, Limited, Scott Building, Winnipeg.

The Dunham Radiator Trap



The First Successful Thermostatic Trap

Passes all air and water without loss of steam and without noise.

Insures a perfect circulation either with or without a vacuum pump.

Write for particulars of our new try-out plan.

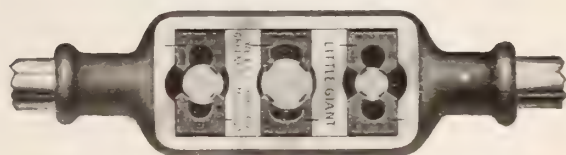
C. A. DUNHAM CO., Ltd.

Toronto, Can.

HALIFAX, MONTREAL, FORT WILLIAM,
WINNIPEG, CALGARY, VANCOUVER.

Which Would You Rather Carry?

3 Pipe Stocks or 1?



But you can have 3
and only carry 1.

Try the TRIO

Nothing to Lose

Nothing to Adjust

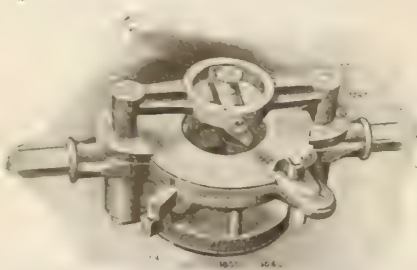
Nothing to Break

"Always ready—Always right"

CANADIAN TAP &
DIE CO., LIMITED
GALT, ONTARIO

Did you ever stop to think!

Why every turn of the old-fashioned die-stock on a pipe is harder to pull than the last. It's because the thread is tapered to make a tight joint, and because the old fixed die is as wide as the length of the thread.



Die Stock Open

Go to your dealer and say,
"Show me the Premier."

In the Premier Die Stock

the dies are quite narrow. They start in on the pipe, cutting the full depth thread, and then automatically recede as they advance. When the thread is cut, they open right out, and the pipe is free to be withdrawn. By means of the patented Offset die, all these movements are obtained without the use of a lead screw and nut.

Now, just think what the No. 2 "Premier" can save you in your work. It's easily

"run up" by one man, where the old die stock took two, and instantly withdrawn without backing off. There are no loose parts to worry about, it cuts 1-2 in. right and left-hand threads with one set of dies, and altogether it's the best thing in hand-threading pipe tools that has been produced for some time. No. 1 "Premier" threads $\frac{1}{2}$ -1 $\frac{1}{4}$ right-hand, left-hand dies extra.

Borden-Canadian Co.

66 Richmond St. East

Toronto, Ont.



No. 501

This Trade Mark



Distinguishes Our

Compression Bibbs

From the many inferior makes on the Market
and is our Guarantee of Satisfaction

Made in any size and in any style from
 $\frac{1}{2}$ in. to 1 in. inclusive.

It will be to your interest to get our
descriptive catalog on "Sydenham"

Brass Goods.

"Jobbers from coast to coast handle the
"Sydenham" Brand.

Order through yours now.

THE WALLACEBURG BRASS & IRON MANUFACTURING CO., LIMITED
WALLACEBURG, ONTARIO.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

Winnipeg,
Moncrieff & Endress, Ltd.,
Scott Bldg.

Montreal,
J. R. Devereux,
142 St. Joseph Boulevard West.

"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

Say Reader!

Are you an old style plumber, adopting old style methods with old style goods—or are you an up-to-date sanitary engineer?

Wolverine "One-Piece" Supplies are just what the up-to-date sanitary engineer needs as they are instantly adjusted—saving time in installation.

Means less trouble because there are no joints except between supply and cock and between supply and pipe at floor.

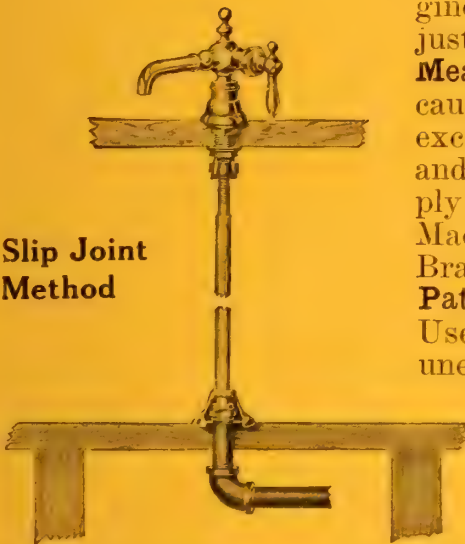
Made of special annealed Brass Tubing and furnished with Heavy Deep Flanges. **Patented and Guaranteed.**

Use Wolverine Goods and you use what's up-to-date and unexcelled in quality.

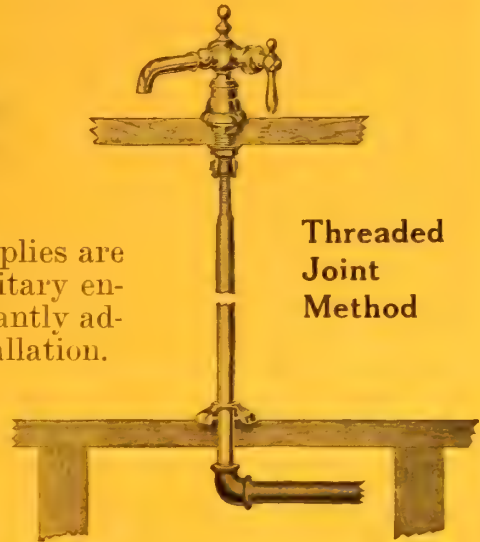
Manufactured by

Canadian Wolverine Company, Ltd.
Chatham, Ont.

Slip Joint Method



Threaded Joint Method



This is The Radiator Valve You Have Been Waiting For

An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will not score, cut or become unevenly worn, as the spindle bearing runs the length of the bonnet spindle cavity.

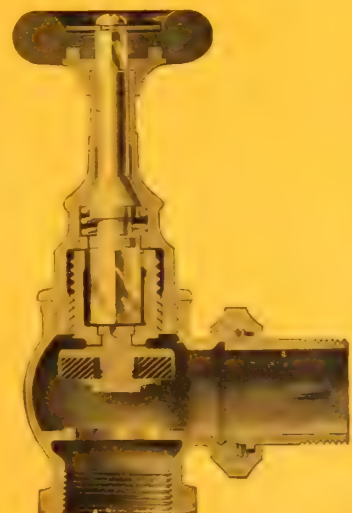
No strain on the stem or stem seat at any time other than the tension of the phosphor non-corrodable spring which holds it in its place.

All the thrust is against the threads on the disc carrier and in the heavy bonnet. The stem simply acts as a KEY to revolve the disc carrier. No inexperienced person can tamper with the working parts of this valve, as they are all

securely locked inside the valve.

Every valve tested with steam, and we guarantee them to be tight.

Give this valve a trial on the next vacuum job or high class steam heating plant.



The Kerr Engine Company, Limited,
Valve Manufacturers,
WALKERVILLE, - - - - - ONTARIO

TRADE MARK
GALT BRASS

R-A-P-I-D--O-P-E-N-I-N-G

“RAPIDO”

Compression
Plain and Hose Bibbs
Bath Cocks
Basin Cocks
Sink Cocks

Interesting
Prices
on

Attractive Designs, Good Metal,
Mechanical Construction.

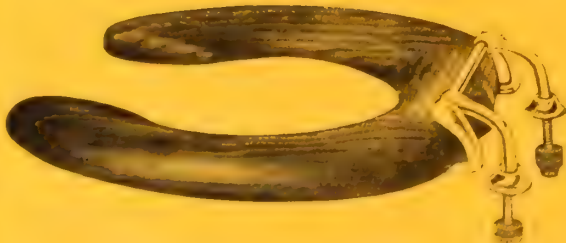
**Extra Quality
Brass.**

Radiator Valves.

Plumbers' Supplies

Send us YOUR NEXT order and YOU will be convinced that our Brass Work will satisfy the most particular Sanitary Engineer.

Galt Brass Co., Limited



This is our open front reinforced closet seat with heavy bar hinge and full $1\frac{1}{4}$ inch stock.

We carry a full line of high-class closet seats of the latest sanitary designs and in all the standard finishes, and if necessary we can match perfectly the woodwork of any room if a sample is supplied us.

Write us for Prices.

**Empire Manufacturing Co.,
Limited**

Head Office and Factory, LONDON, Ont.

Montreal Office, Room 31, C. P. R. Telegraph Bldg.
Winnipeg Office, 103 Carlton Block, Portage Ave.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 701-702 Eastern Townships Bank Bldg.
LONDON, ENG., 88 Fleet St. E.C.

TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

WINNIPEG, 34 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VII.

Publication Office : TORONTO, NOVEMBER 15, 1913

No. 22



THE STANDARD

COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA



PLATE F370.

PORCELAIN Enameled Flat Rim Laundry Tray and Sink Combination, with one-piece separate back on painted pedestal and sink bracket, strainer, waste plug and rubber stopper, Fuller bibbs and 1½" "P" Traps.

Size of Sink	18"x30"
F370A, as described	\$42.25
F370, less bibbs and trap	27.75
For 20"x30" size sink add	1.50

Ideal Flat Rim Laundry Tray and Sink Combination

A NEW DESIGN
AT A
VERY LOW PRICE

WRITE FOR CIRCULAR.

TORONTO

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410 CARTER COTTEN BLDG.

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

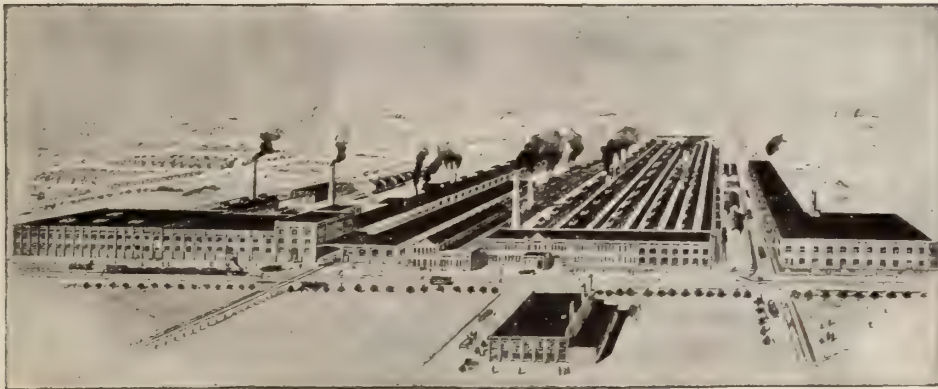
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
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GENERAL OFFICES AND WORKS:

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"When writing advertisers please mention that you saw their advertisement in the *SANITARY ENGINEER*."

"Standard Sanitary"

Modern Bathroom



Design P-60.

The bathroom illustrated above is an extremely well planned interior for a moderate sized house. The entire equipment, while inexpensive, is most satisfactory and practical.

The Closet Bowl is of the "Standard Sanitary" "Vitrite" porcelain, the surface of which is hard, smooth and non-absorbent, therefore highly sanitary, while the Tank is porcelain enameled.

Our long experience has particularly demonstrated the special fitness of porcelain enamel as the ideal material for Closet Tanks.

Enameled Tanks will not sweat, crack, need no lead, copper or other lining, and will not rust. There is no wear-out to the porcelain enameled Tank.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

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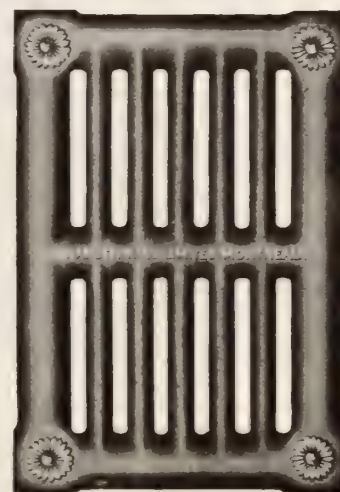


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The New

“VIKING”

RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

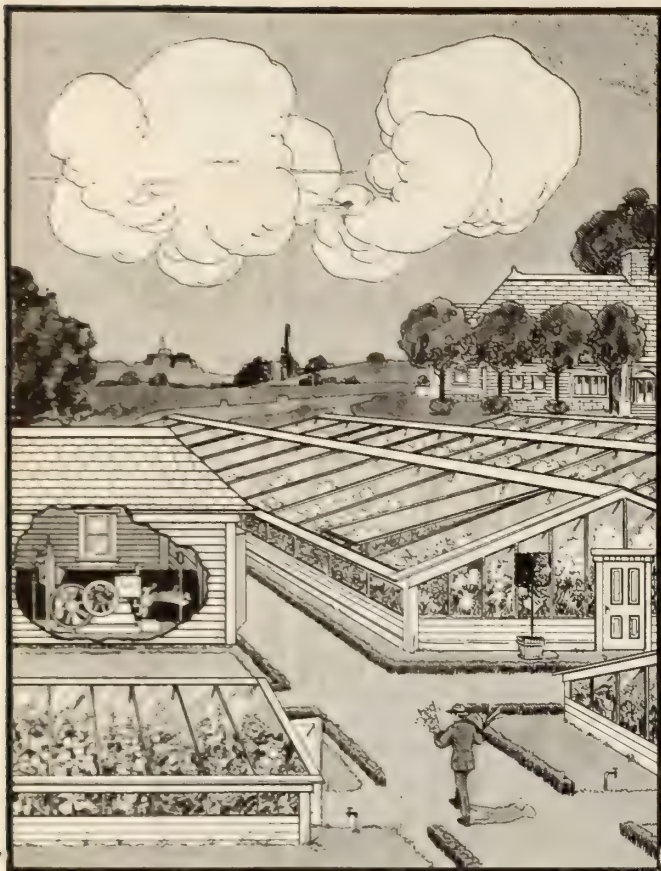
We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

WARDEN KING LIMITED, MONTREAL
Branch, 200 Adelaide St. West, TORONTO

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“When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.”



Above illustration taken from front cover of the "Leaderite," November issue published monthly by the Leader Iron Works.

GREEN HOUSE WATER SUPPLY

¶ There has never been a time when the market called so continuously for green food products as to-day, making improved methods in the greenhouse industry a necessity. The majority of these places are outside the city water supply, therefore they must have a dependable, fairly good sized, private water plant.

¶ You will find this trade interested and ever-ready to talk "Water Supply," because it is necessary in their business. They must have water the coldest day in winter as well as the hottest day in summer, and the possibility of an overhead tank freezing in winter, thus cutting off their water supply, is to them, an item of vital importance.

¶ Leader Water Supplies are particularly adapted to greenhouses. The Leader organization has made a thorough study of this particular field and has devoted time and money to determine the requirements of greenhouse operation. This information is now at your disposal. Get in touch with your local florists, spend an hour or so with each of them, find out their difficulties, then write for particulars to the nearest Leader office.

¶ Have you on file the latest Leader literature, Water Supply Catalog F-1913, "The Question of Water" and Leader Gasoline Engine Catalog A?

Leader

"The mark of gold is a symbol of everlasting value."

DISTRIBUTORS:

**The GENERAL SUPPLY COMPANY
OF CANADA**

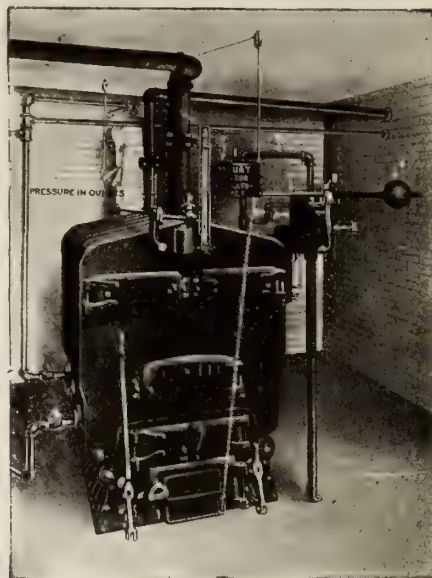
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WINNIPEG

The Mouat Graduating Vapor Heating System

Positive temperature control at each radiator.
Any fractional portion of a radiator may be heated to suit weather conditions.



The Mouat Automatic Vapor and Damper Regulator is the simplest, safest and most efficient device of its kind on the market.

Live heating contractors wanted to represent us in the Dominion.

Write to-day for our proposition.

The Mouat-Squires Company, Cleveland, Ohio

300,000 lbs.

carried in stock for immediate
shipment of

Brass and Copper Pipe
Iron Pipe Size.

Brass and Copper Tubing.

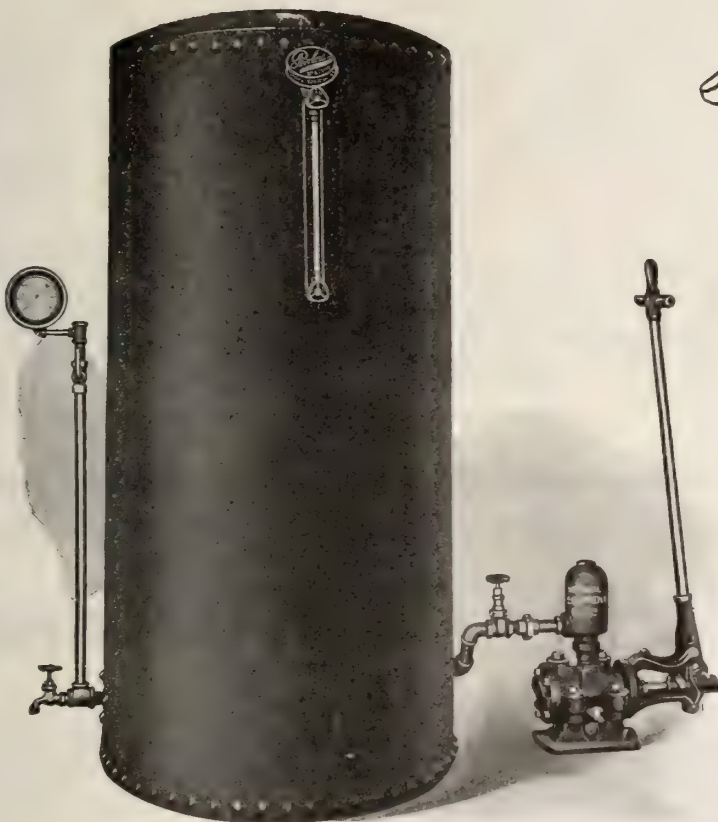
Brass and Copper Rod.

Brass and Copper Sheet.

Tallman Brass & Metal Co.
HAMILTON, ONT.

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Count the Fittings in this Cut



A Simple Peerless Water System

Figure 112 B can be supplied with vertical or horizontal tank as desired, with our latest improved pump, having raised discharge valve which cannot "airlock," ratchet handle that cuts down the labor one-third **AND AN ABSOLUTELY UNLEAKABLE AIR INLET.**

The following new list prices are lower than ever and are subject to your usual discount:

Price List.

Fig. 112 B with 24x6 tank, list price \$ 80.00
 Fig. 112 B with 30x6 tank, list price \$ 92.00
 Fig. 112 B with 36x6 tank, list price \$102.00
 Fig. 112 B with 36x10 tank, list price \$135.00

Could you put them together in half an hour?

How much longer would it take you to line and instal the old-fashioned attic tank?

When finished, which would most enhance your reputation as an up-to-date contractor?

Which would make for you the most money per hour?

National Equipment Company, Limited

Toronto, Canada

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MADE *in* ENGLAND

Honeywell Heat Generators are now made at Birmingham, England, from which point the requirements of Great Britain, Europe and Asia are supplied.

In 1906—seven years ago—the first Honeywell Heat Generator was made for sale at Wabash, Ind. During that first year exactly 1,618 Honeywell Heat Generators were manufactured and sold to fitters in the United States.

In 1907—the year of the panic in the U.S.—exactly 5,257 Honeywell Heat Generators were made and sold in America. Since that time the demand has increased to such an extent that during one month of last year there were almost as many Honeywell Heat Generators sold as were made during the entire year of '07.

In 1908 there came a demand from foreign countries for Honeywell Heat Generators; this demand grew until we decided to manufacture our Generators in England to properly supply foreign requirements.

This great, and constantly increasing demand proves better than anything else the merits of the only absolutely safe and dependable seal for hot water heating systems—the Honeywell Heat Generator. You should know all about it and how it is used in connection with the Honeywell method of piping.

If you haven't a copy of our fitter's handbook, write for one. It tells all about Honeywell Hot Water Heating.

Honeywell Heating Specialty Co.

1008 Eastern Townships Bank Building
MONTREAL

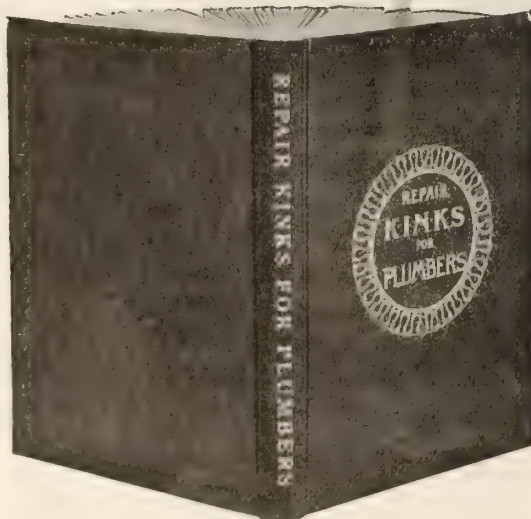
WABASH, IND.

BIRMINGHAM, ENG.

NEW YORK, N.Y.

You Need This Book in Your Business

It will appeal especially to the man controlling a repair business. It will be equally useful to those in charge of buildings. Its table of contents gives some idea of its great scope, no less than 26 subjects being mentioned. Here are some of them:



The matter of taking up the repair of the appliance most commonly out of order, the Kitchen Sink; The Service Pipe, methods of freezing for repair work, etc.; Fuller Bibbs are touched on, as are also leaky Waste Connections; a clear and concise description is given of the action of Flushometers.

Space will not permit us enumerating further the many questions, etc., which are treated very fully in this extremely practical and valuable book. Price 50c postpaid.

We also have technical books on practically every subject pertaining to the heating, lighting, ventilation and sheet metal trades. Write us for list.

TECHNICAL BOOK DEPARTMENT

143-149 University Avenue, Toronto

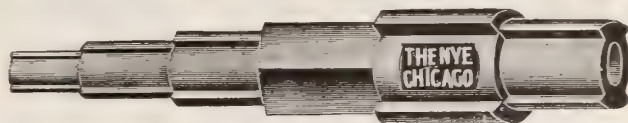
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Nye the Die Man

The Strong Man Asks No Favors

When he tackles a piece
of work he does it.
Nothing Buffaloes him!



3/4 in. 1 in. 1 1/4 in. Wrench 2 in. 1 1/2 in.

Price 75 cents net each

The Nye Union Valve Nipple Wrench Is Like a Strong Man. It Works

It is made of the best material. It never slips. It is light and easy to handle. It does not mutilate the nipple.
It lessens the profanity output and tickles like a feather duster.

I don't ask you to believe in the superiority of the Nye Wrench until you have been shown. Drop me an order and I'll ship you the tool on a free trial. It is so different from the cat, it will never come back.

The Nye Tool and Machine Works

124 N. Jefferson St.,

Chicago, Ill.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

TWO CENTS PER WORD

You can talk across the continent for two cents
per word with a Want Ad. in this paper.

PEASE IDEAL STEAM BOILERS

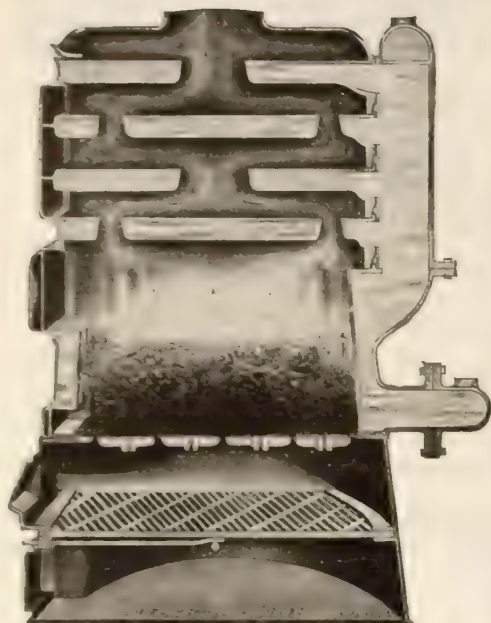
Write to-day for
Catalogue and Prices.

PEASE FOUNDRY CO.
Limited

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton, Montreal

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STEEL AND RADIATION, LIMITED



Cross Section, No. 5 "King," showing Corrugated Fire Pot, Tapered Smoke Passages, Big Mouths into Water Post, Scientific Arrangement of Heating Surfaces.



"King" One-Piece Ash Pit showing Side Lever Shaker, Trouble-Proof Grate and Sliding Mechanism.

You don't have to draw on your imagination—

To sell a man a "KING" Boiler.

Simply point out its many advantages, and he will be convinced.

From Ashpit to Smoke Pipe its "improved," "up to the minute," and just a lap or two on every point ahead of any competitor.

Show your prospect the "**Patented**" Trouble-Proof Grates of the "King" Boiler, connected without split-pins or bolts.

Let him try the "side lever shaker" and demonstrate to himself how much easier and simpler it is to operate than the old-fashioned, back-breaking "crank."

Tell him about the "double in size" **mouths on the water post** and their importance in quickening circulation.

Explain to him the "**Corrugated**" **Firepot**, which **increases** its Heating Capacity one-third, also the large combustion spaces between sections, which allows the gases to burn before going to the smoke pipe.

These and the other manifold features of the "**King**" Boiler are ones that make an impression on a man. A half-hour's talk on straight common-sense advantages like these will influence your prospect more than all the "oldest firm" and "longest record" pleas the other fellow can think up in a week.

King Boilers are making records and reputations for themselves and those who install them.

"**King**" and "**Imperial**" Radiators are so well and favorably known that it is only necessary to mention them.

We guarantee prompt delivery.

We carry a full and complete line of Steamfitters' and Engineers' supplies.

Did you get one of our "**New Fitters' Hand Books?**" If not, ask for one. In it we illustrate and list our complete line of "**King and Royal Boilers and King and Imperial Radiators,**" also other valuable information.

STEEL AND RADIATION, LIMITED

HEAD OFFICE, Fraser Ave., TORONTO

Branches:

138 Craig Street, West, MONTREAL
101 St. John Street, QUEBEC

Showrooms:

80 Adelaide Street East,
TORONTO

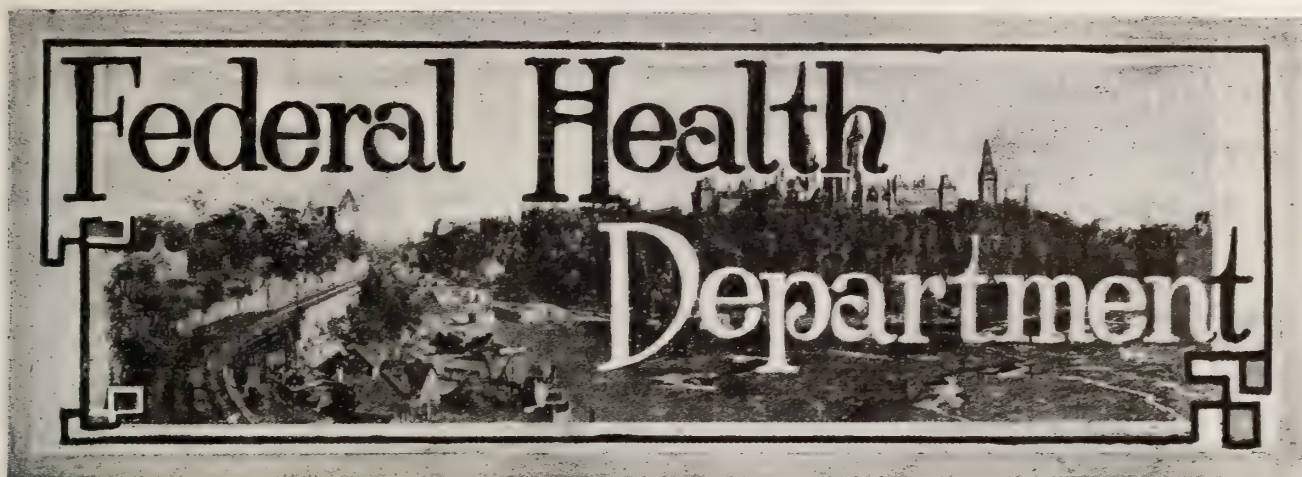
Agencies in all the leading Cities in Canada

THE SANITARY ENGINEER

VOL. VIII.

NOVEMBER 15, 1913.

No. 21



Ottawa. — A general endorsement of the movement now under way for legislative action to prevent the pollution of all navigable water supplies was given by the Provincial representatives who met in conference here on the invitation of Hon. J. D. Hazen to discuss the question. As one step along this line the conference passed a resolution urging the creation of a Federal department of health.

The conference was called as a result of the evidence obtained last winter by the special committee of the Commons on the pollution of streams. It was deemed advisable to have the views of the Provinces on the question before anything of a definite character would be done, and in response to an invitation sent out by Mr. Hazen every province in the Dominion was represented at a gathering in the Agriculture Committee rooms of the House of Commons this morning.

Mr. Hazen who was elected chairman, reviewed the introduction of bills in the Senate and Commons by Senator Belcourt and Mr. G. H. Bradbury, and the work of the committee on the pollution of streams.

The Lesson of Ottawa.

Mr. Geo. H. Bradbury, M.P., Chairman of the Commons committee, outlined the evidence which it had taken. He was led to take action on this matter by the condition of affairs which had befallen Ottawa, where more than two thousand lives were lost as a result of a typhoid epidemic, which was a direct outcome of an impure water supply.

At the afternoon session a resolution, moved by Dr. E. P. Lachappelle, Montreal, and seconded by Dr. Seymour

from Saskatchewan, was carried unanimously that "whereas in the past, questions affecting sanitation and public health to be dealt with concurrently by the Federal and Provincial authorities, amongst others the question of protecting water-courses from pollution, have suffered from the non-existence of a Federal department of health, this conference considers that the creation of a Federal department of public health might well receive the early attention of the Dominion Government, the conference believe that such a department would be of assistance in solving inter-Provincial problems as to the protection of public health."

Hon. Martin Burrell, Minister of Agriculture, said that the matter of a department of health in the Dominion Government had been discussed at different times, but there were certain difficulties to be cleared up, and although the Government had moved slowly in the matter, that was perhaps better than acting without sufficient consideration. There was the fact, too, that the Provinces claim far-reaching powers in regard to public health under the British North America act. Hon. Mr. Hazen said that the combined work of the International Waterways Commission, the Conservation Commission and the special committee should have good results in solving the problem of protecting waterways from pollution.

Purify Water Supply.

Mr. T. Aird Murray, Toronto, said that to aid municipalities in planning sewage disposal plants there was needed a Royal Commission to gather data and lay down principles that should be followed owing to conditions in this

country which in many ways were different from those in Europe. Some plants built here at considerable expense were failures. Mr. R. S. Lea, Montreal, thought a disproportionate emphasis was placed on purification of sewage as compared with purification of water supply. He would proceed with the latter first.

Dr. Chas Hodgetts, medical adviser to the Conservation Commission said there could be a simple Federal act given into the hands of a central body to apply in conjunction with the Provincial bodies. "British municipalities have scrapped more in the way of sewage disposal plants than almost any other country has spent on them," he said, in supporting the idea of a central authority to give advice on the subject to municipalities. "The Government should have proper experts not only to pass or reject the plans submitted by the municipality but also to make suggestions."

Early Action Needed.

Dr. Pelletier of the Quebec Board of Health, proposed that the conference should deal only with boundary streams, but after a short discussion this motion was withdrawn. Before the conference concluded Hon. Mr. Hazen said that the difficulties resulting from the pollution of streams were growing all the time, and the matter should be dealt with before the country becomes much larger, a lesson being learned from the pollution of streams in Europe and the United States.

He was satisfied the committee would be continued, and it could gather a mass of data from which conclusion could be drawn for the framing of legislation. The jurisdiction between the Provinces

and the Dominion could be easily worked out, although it was essential that this should be done before legislation is passed.

Sanitary and Heating Engineers Should Welcome Movement.

This very commendable movement is one worthy of the most earnest consideration from those engaged in the craft. It sounds a note for better sanitation; it gives those engaged in the craft something to stand up for by way of laws and by-laws to better govern sanitary heating and ventilating.

The Provincial Governments have done wonders in this new country of ours.

If we stop to consider the age of this fair dominion and the state of our sanitary engineering, why we've not done so bad after all. But most of those engaged in sanitation know this, and have become to a certain extent indifferent. Hence, Ottawa's recent typhoid, Toronto's vast number of cases of tuberculosis. All over the country we hear of great loss of life. Just imagine 2,000 souls having been called away to the Great Beyond just because of the indifference of those who might have sounded the danger signal. There were men who did, but there was not a department to listen to such complaints, and so death took toll.

Preventable Disease.

Much has been said re typhoid fever, but still we find people do not seem to realize that this is a filthy, preventable disease, one which each and every human being should do all in their power to prevent. For instance, in small towns there are thousands of people all over the Dominion who, when building a house, have no idea how they are going to dispose of their sewage, and if perchance there is a lake or stream, why, it is allowed to run into that. Then if typhoid is developed and the excreta is allowed into this lake or stream what is the result? Death to sometimes scores.

A Suggestion.

"Sanitary Engineer" has formulated a chart by way of a suggestion as to the different departments which could be embodied in a Federal department of health. This chart suggests six departments under the one head, which would be able to assist along any line the different provincial health departments.

Pollution of Waterways and Supplies.

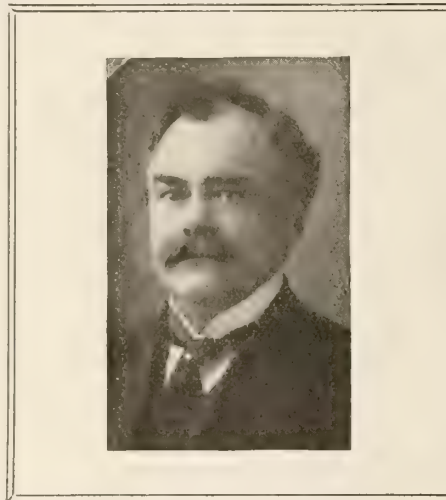
No. 1 would deal exclusively with the pollution of waterways or water supplies, and study the best method of water filtration suitable for different localities. The pollution, of course, does not always take place because of the close proximity of human habitation. There are various means of pollution,

hence this matter should be taken up by a thorough competent body of medical men, who could in many cases locate the trouble of water pollution by reports received of the illness of persons in the different localities.

The country medical practitioner could be brought into prominence in this way. He should be made to report every case of sickness to this department, however slight.

No. 2.—Board of Examiner of Provincial Health Officers.

This board should examine and appoint provincial health officers for the province, who in turn should be called upon to report to the board all matters of a medical nature, such as the hospital accommodation, asylums and homes for incurables, etc.; also the different epidemics or cases of sickness which have been the cause of matters under the head of the federal offices. There



HON. JNO. D. HAZEN.

are scores of cases which the provincial departments do not feel they should be saddled with, but which could be taken care of by the Federal Government.

Examiners of Sanitary Engineers.

No. 3 should be a body of men known as the Board of Examiners of Sanitary Engineers. These men should be experts in sanitary engineering as far as such knowledge has been evolved; they should be men who could study the best methods, watch the different systems of sewage disposal from an engineering standpoint. They should examine men who wish to become provincial sanitary engineers or inspectors. They would in a general way be asked to keep records of all data appertaining to sanitary engineering from all parts of the world, thus keeping the Dominion in daily touch with every scheme which was being tried out and found either successful or otherwise. Then if, perchance,

some disease did visit a certain locality they would know the cause of it, and have a stop put to it at once. Instead of this, at present we fly from one country to another getting information, while the epidemic is carrying away its scores of lives.

Board of Arbitration for Boundary Streams.

This body of men would be called into commission for such purposes as the name implies. They could watch the different questions which may arise between Provincial Governments re the crossing or re-crossing of waterways. Cases would arise where one municipality may desire a water supply from a province other than the one in which the town or city was located, and in many an instance it may be found that one city may wish to locate an intake pipe on the shores of another municipal or provincial territory, and a thousand and one questions would come under the observation of such a body.

Of course, it might be here stated that several of the officials in this Federal department could act on several of these boards, but they would have to be qualified men as a whole. This department would, besides being thoroughly qualified, need to be composed of men with unquestionable characters—men who could not be bought over by political influence in any way; men who had humanity's welfare at heart, whose whole soul was in the work. Such men only could carry or will be the ones who will carry sanitary problems to a successful issue.

Sanitary Engineering Department.

This department would be brought into play for the executing of research work, such as experimental, constructional, etc., making tests of traps of all kinds, testing all kinds of fittings which were brought into the construction of sanitary engineering feats. Every day we hear of a new fitting and new scheme, etc., of venting, reventing, backventing, wet venting, etc., and a thousand other methods of running piping in connection with the different buildings which are being put up all over the country. We all know that trap-venting is good under certain conditions; we also know such a practice is equally bad under other conditions; and we need a department of this kind in the worst way. The country needs it. Every little town will be a large city soon, and their by-laws should be watched by a department of this kind.

Climatic Conditions Considered.

In Canada we have climatic conditions which need to be considered from an engineering standpoint, and these constructional matters should not be left to those who are practising in the trade.

Our different city by-laws will show the proof of that. For instance, in some cities all traps used are to be those claimed to be anti-syphonic and no back-venting is called for. Such a stand is wrong, for the simple reason that under certain conditions, no matter what kind of trap is used, it would be absolutely necessary to vent it. The same argument holds good where it would not be necessary to back-vent it.

Then other cities call for every trap to be vented, whatever kind it be or the condition and place it is installed. Such a course is, to say the least, ridiculous. There is no doubt this board of sanitary engineers would be a boon to this, our new country. They would be able to assist in the application of a new code of constructional by-laws, which would be of great assistance to the provinces, towns and cities. The testing of traps, the trying out of different methods of piping, the sizes of piping, the velocity of wastes which travel through said piping, all such matters. The hoar frost question could be thoroughly investigated. In fact, the elimination of all or any practice in constructional matters which is found to be bad could be dealt with. Then come last, but not least, and that is the heating and ventilating problem.

Heating and Ventilating Engineer's Department.

This question to-day is really in its infancy. We know so little of either that we seem to be content in using up all the fuel we can pile into our furnaces and heating apparatus. We are not only doing that, which costs money, but we are generating cases of tuberculosis faster than our medical faculty can cure them.

"Sanitary Engineer" claims that prevention is better than cure, and we are not alone in our view.

Now how can we solve this problem? By simply having a Federal depot of health, comprised of a board of heating and ventilating engineers who can work out these problems; men who can study climatic conditions, who can formulate plans of heating and ventilation; then hand these plans out and see they are carried out. This heating and ventilating problem is just as necessary to humanity as the problem of water supplies.

Under present conditions we are not only allowed to pollute the water we drink, but also the air we breathe. We have men who are installing hot air furnaces in, to say the least, most unsanitary ways. There are furnaces being installed which are poorly and cheaply gotten up, just with the view of supplying the wants of the "jerry builder and cheap speculator." We have good hot air furnaces which are too small for the different buildings they are called upon

to heat. Of course, the question of climatic conditions has to be considered, and such questions could be dealt with by this department.

Then the steam and hot water heating systems are anything but properly installed as a whole. If we could get some uniformity in this matter, cheap work would be unknown, price cutting would take wings and fly away. But there are so many wrong ways to instal these systems and so few right ways that the price cutter, cheap jack, and all other questionable characters are allowed to instal our heating plants in any old way.

The Ventilating Problem.

Heating and ventilating are so closely allied that we naturally refer to them in one phrase, although not one case in a thousand, yea, fifty thousand, are there any provisions for ventilating our homes. We assume that if we have some cheap crude way of making an opening in our windows or over the doors we are providing for proper ventilation. But such is not the case. What we are doing is creating a lot of inconvenient drafts. We endanger our health thus far. What we need is a system of ventilation, and there are several already which have proved to be very meritorious. Of course, they cost in the coal bill. But who would object paying for an extra ton of fuel if by so doing they are cutting out the danger of contracting all diseases which are caused by poor ventilation? We may venture to say very few. There are scores of instances where our homes are too warm, which costs and in such cases less fuel and more ventilation would, of course, cost less and at the same time give better results. All these measures, all these departments and the services of all these men would help our craft. It would cause none but qualified men to ever attempt to engage in the trade, thus cutting out the "curbstone plumber" once and for all. It would raise our craft to a higher efficiency, and as a whole we should naturally become more professional in every way; and, besides all this, by the inauguration of a Federal health department we should have the law of the land at our service. Sanitary and heating engineers should take note and follow this question up from their standpoint in no small way.

DISSOLUTION OF PARTNERSHIP.

Messrs. Maxwell & Johnston, sanitary and heating engineers, Queen Street, Toronto, have recently dissolved partnership. F. R. Maxwell has taken over the business, and will conduct it himself at the same address. He has had considerable changes made to the store since taking it over.

FOUND DEAD IN A ROWBOAT.

Brockville.—The remains of George Kelly, plumber, who disappeared last Friday while at work on a cottage for J. W. Butler, of New York, have been found in a fallen position in a rowboat about fourteen miles west of here. Kelly whereabouts had been eagerly sought for by his relatives, and the finding of the body would indicate that the man had died while rowing from his work to his boarding house, a half-mile distant.

TRADE NOTES.

Ingersoll, Ont.—Engineer F. W. Thorold, of Toronto, has submitted to the council plans of a sewage system, the estimated cost of which is \$59,000.

Dundas, Ont.—The town council will build a sewage disposal works, and try to obtain a water supply from Lake Ontario in conjunction with Hamilton.

Battleford, Sask.—A. MacLaine has opened an establishment for the carrying on of the sanitary and heating engineering business.

A. N. Bronson has also started a sanitary and heating business in this town.

The Battleford Furniture, Plumbing and Heating Co., have dissolved partnership.

BROKE SANITARY BY-LAW.

Oakville, Ont.—For a breach of the Plumbers' by-law Inspector McLaren laid a charge against Parriek & Ribble. They were charged with having covered up a certain connection after it had been condemned by the inspector. After hearing the evidence, an order and conviction was made by the police magistrate that the defendants be given twenty-four hours to uncover and lay bare the said connection for inspection, and after being duly inspected and found satisfactory the defendants to cover up and fill in the earth again. For every day after 24 hours in default a penalty of \$5 to be added.

Editor's Note.—This is a very rare instance where a plumber is called before a magistrate for doing such a thing, and there should be more cases. We know of many an instance where, while work has barely passed the necessary test, it has been allowed to go, because the inspector would not be backed up in his decision. "Sanitary Engineer" endorsed that any proceeding be taken by those in authority which will be fair to both engineer, public and craft. These incidents tend to enforce the employment of more efficient workmanship, thereby raising the standard of sanitary engineering.

Practical Water, Air, and Smoke Tests

Read at Meeting of the Canadian Institute of Sanitary Engineers,
Showing the Advisability of Thorough Testing, Both Roughing
in and the Final Test—Using Air in Winter in Place of Water
When at Such Times There is a Great Possibility of Freezing.

BY J. R. HUNTBAC, EDMONTON

In speaking to a meeting of this character upon such a subject as tests as they apply to plumbing and sanitary work, I realize at the outset the difficulty of injecting new lines of thought which might make the paper is interesting as I would like. The only consolation I have is the fact that the paper has to be short, and I might add that in this respect I intend to comply with the by-law.

It goes without saying that at least two tests, one on the rough plumbing and one on the finished work are absolutely necessary and imperative. It has been argued that on small work where not more than one w.c. and one sink are installed that one test is sufficient, but to this argument I take exception as many times internal flaws or ruptures in fixtures and traps are made apparent by a final or smoke test which could not be detected by a water test.

I presume all here know as much about this subject as I do myself. However, as this task has developed upon me I must ask your indulgence while I briefly review the actual process of testing the sanitary engineering system of a building.

The water test is the first test to be applied in an official way and this is applied to the rough work. It should not, however, be the first test, for every piece of material which is installed should be tested in some way before it is put into position.

I do not mean by this that it is necessary to resort to any elaborate testing process but any simple tests such as a tap with a hammer to cast pipes and fittings would indicate cracks or flaws. The use of metal too cold to flow properly in the moulds is often visible and these fittings could be rejected and so save expense, and if not a flow of foul gas into the premises a flow of foul language from the master and operative sanitary engineers.

To return to the actual testing of the work. First all ends of branch pipes are soldered up or in some other way closed. The lower end of the stack or drain is closed with a plug and water is either forced in under pressure or the system is filled from the top by means of pans, etc., in case there are one or more vertical stacks which terminate below the highest one, it will be necessary to plug them when the water reaches the top of

them and the filling continued until the highest level is reached. The plug at the lowest point should be provided with a hose cock so that the water can be drawn off without unnecessary splashing or damage to property.

When the whole system is filled, the inspection is made. Leaks are at once apparent. If joints are faulty, they are caulked. If the trouble is due to cracked pipes or fittings they are removed and replaced with sound material.

It is the duty of the inspector during the application of this test to see that all vertical and horizontal stacks and pipes are provided with proper floor rests, stirrups or substantial boards to adequately protect the pipes from settlement or sagging, that all branch pipes have a fall in the proper direction, that traps are provided as required and that when the fixtures are installed they will not waste through more than one trap except under special arrangements. In other words that the work complies with the requirements of the local by-law.

When this is done the work may be passed and a certificate attached to same, stating the results of the test.

It may be readily seen that this test does not exert the same pressure throughout the system but that the pressure is greatest at the bottom and reduced to the vanishing point at the level of the water in the system. In testing tall buildings, therefore, such as the West is developing and the demand for which is increasing, it is necessary or advisable to install cleanouts at intervals of not more than 40 to 50 feet, so the tests may be applied in sections of say four floors at one time. Any pressure above this amount is inadvisable and totally unnecessary.

Care must, however, be used in the installation of these cleanouts if the maximum of service is to be obtained from them. They are of great use also in localizing of leaks which may occur in the final test.

Another point which the inspector should note in the installation of sufficient cleanouts in accessible places which will later on make it possible to remove stoppages in pipes without having to break them out.

The water test is the best test that can be applied to the rough plumbing. It is sure, simple, economical: leaks are

readily seen and all troubles are easily rectified.

It would be extraordinary, however, if there were not two sides to the question. As before stated, the pressure is uneven and in cold weather when a building is not closed in there is a liability of the pipes freezing up and of the test being ineffectual.

Under such conditions or where water is at a premium, it may be advisable to apply an air test. For this purpose it will be necessary to close up all openings including the top and bottom of all stacks and then with the aid of the air pump to which is attached a suitable pressure gauge force in air until the gauge records 5 to 10 lbs. pressure: if this pressure is maintained for say 10 minutes and all other conditions of the work comply with the local ordinance the work may be passed.

In case the pressure falls, the work is not tight and leaks must be located, which is a more or less difficult task; usually they can be found going over the work with a brush and soapy water, but if the weather conditions will not warrant this procedure, other methods must be adopted, such as smoke, etc., which means a lot of time and trouble, and although this test gives an even pressure throughout the whole system and has certain advantages, those who have experienced with it once generally fight shy of it for the rest of their lives.

When the rough plumbing has been passed, the plumber may proceed to install the fixtures.

When all fixtures have been installed and before the work is finally accepted as O.K. by the inspector, a final test is applied. For this purpose a test known as the smoke test may be considered safe and satisfactory if same is applied by means of a smoke machine and not with cartridges, etc.

To make a satisfactory test all openings above the roof are closed, all traps are sealed with water and the lower end of the main drain is closed by means of a plug to which the smoke machine is attached.

All that is necessary, when this preparation has been made is to pump in sufficient air to raise the float in the machine. If the float remains in this position for five minutes, the work is gas tight.

(Continued on page 16.)

Smoke Causes Pneumonia Proved by Tests

Number of Deaths From the Disease on Increase in This and Many Other Cities—This is Not Only an Economic Waste But Polluting the Air We Breathe Which Should be Guarded Against—Heating Engineers Should be Interested in Such Matters.

Pneumonia carried off 35 persons in the city of Toronto during the month of October as against 24 for the corresponding month last year, according to the report of Dr. Hastings, M.H.O., submitted to the local Board of Health recently.

"The disease has unfortunately been on the increase for several years and no efforts put forth by the departments of health seem to have any influence in its control. The increase in all the large cities has been approximately 10 per cent.

Smoke the Cause.

"Attention has recently been drawn to the influence of city smoke in the increase of this disease. Prof. Asher of Konigsberg, who has made a careful study of the relation of smoke to tuberculosis and pneumonia has pointed out that there has been a steady increase in pneumonia in proportion to the increase in manufactories and commerce, and that the increase is much more marked in cities than in rural districts. This he explains as being due in a great measure to the increased contamination of the air by smoke.

"Since 1875 the death rate of infants from pneumonia has increased 600 per cent. There is a very noticeable difference in the death rate from pneumonia in parts of cities where contamination is slight, and in the industrial districts, where the contamination is much greater.

76,000 Tons of Soots.

"Tests conducted in Philadelphia recently, by two prominent doctors prove this. In London each year there are 76,000 tons of soot deposited in the streets annually and 40 per cent. of the sunshine is blocked by the heavy soot-laden clouds. It is estimated that smoke deprives London and Pittsburg of almost half their possible sunlight in the winter and one-sixth in the summer. Smoke in Pittsburg has caused a loss of \$4,000,000 per year to the manufacturers of that city."

Electric Engines Needed.

The M.O.H. points out that Toronto has a smoke by-law but that it is hard to enforce it. He also points out that as the railways are the greatest offenders that the city like New York should get legislation to have all engines within the city limits electrified.

Here is another argument in favor of our heating being under some authoritative board of engineers in the employ of a federal head. It is interesting to our craft of heating engineers for the simple reason that so much work is planned by those who are only interested in the mere dollars and cents. Who are merely Jerry speculation builders or contractors. Men who never care a rap so long as they are able to put a house up for sale with hot water, steam or hot air furnace installed.

Cheap, Poor Installations.

The hot water boiler is oftener than not, of too small a capacity, often there is not sufficient radiation in the house, or on the other hand a low priced as well as too small a hot air furnace is installed which makes it necessary to force the fires in the furnaces which results in a loss in the actual results which would be eliminated by a slow burning fire. Then again a slow burning fire gives off less soot than one that is forced, and the amount of fuel burned in the homes of Canadian cities is far more than those in our European cities. Of course it must be stated that the coal used in the British Isles as least is chiefly soft coal.

Chimneys Often Too Small.

Another matter which does not often get the consideration it should is the size of our chimneys. The writer had an instance brought to his notice where a pair of sectional boilers were installed in an apartment house, which, in the first place was a large private residence.

There happened to be four open fire grates in the place formerly and the owner insisted that he could not understand that a new chimney was required, and insisted in having these furnaces connected to this chimney. It had four separate inlets and outlets, but at the bottom the divisions were broken out so as to connect them all together.

Got Poor Results.

Strange to say for the months of October and first three weeks of November this chimney acted fairly well, but, when the heavy firing commenced, it was found absolutely worthless, and gave no satisfaction whatever. We as heating engineers should, therefore, attach greater importance than has hitherto been taken regarding the sizes, height,

and other particulars which are apt to concern the draft of the chimneys.

These particulars should be taken into account such as grate area, kind of coal to be used, location of top of chimney, and construction of same. It is always on general principles to ensure sufficient chimney area. Of course there are conditions when a certain size of a chimney would give satisfaction. When under other conditions the same would be altogether unsatisfactory. Therefore (we must see to it that the boilers and furnaces we instal are fitted to a good chimney to suit the condition, such attention will give good results, as fuel saving, as being more sanitary and as giving the best results for fuel burned. It must not be forgotten that fuel saving is also time saving and to-day it is a question which is the dearest commodity of the two.—Editor.

SOMETHING WE SOMETIMES FAIL TO DO.

If you see a tall fellow ahead of
a crowd,
A leader of men, marching fearless and proud,
And you know of a tale whose
mere telling aloud
Would cause his proud head to
in anguish be bowed,
It's a pretty good plan to forget it.

If you know of a skeleton hidden away
In a closet and guarded and kept
from the day
In the dark, and whose showing,
whose sudden display,
Would cause grief and sorrow
and life-long dismay,
It's a pretty good plan to forget it.

If you know of a thing that will
darken the joy
Of a man or a woman, a girl or a boy,
That will wipe out a smile or the
least way annoy
A fellow or will any bright gladness cloy,
It's a pretty good plan to forget it.

—Selected.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription Canada, \$1.00 per year.
United States, \$1.50, Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS:
Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - *President*

J. G. Lorriman, - - - *Manager*

Edwin Newsome, - - - *Editor*

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, NOVEMBER 15, 1913

SANITARY ENGINEERS AND SANITARY INSPECTORS.

This is a very vital and interesting subject to take up and particularly at this time and for several reasons.

In the first place we are given to understand that most of the associations interested in sanitary engineering are beginning their meetings and are laying out their work for the winter sessions.

This subject has been referred to us many and many a time, but we have up till recently failed to receive a specific case where poor installations were being put in and passed by unqualified inspectors.

However, at last we have had a case brought to our notice which is a disgrace to those who are at the head of sanitary matters; and, in a fair sized Canadian city, where too an unqualified person is placed in the position as sanitary inspector of plumbing. Of course we know this is only one of the many cases which are taking place every day right here in Canada.

We hear of tinsmiths, shoemakers, carpenters, butchers, dry goods clerks and raw college graduates holding the positions of plumbing inspectors. Simply because we allow it, simply because there are those in the craft who know no better how to instal thoroughly and properly sanitary engineering than those placed in the positions to inspect their work. Now this is chiefly the results of the fact that anyone can get a license for \$1.00 or \$2.00 in most of our cities, which should not be the case.

None But Efficient Men.

In the first place one should as a whole bring pressure to bear upon our council or as we mention in another article, on a federal health department that it requires first-class craftsmen to instal the sanitary engineering in our homes, etc. We should meet and discuss these problems at our association meetings. We should show in concrete a form that the repair work which has to be done is tremendous as a result of poor installations in the first place and last, but not least, we should create amongst ourselves a public spirit that no cheap work be installed

Thus Guard the Public.

The public as a whole want good work, but, they are not judges of such work. The craft should take note of every installation which has been taken at a cut price. They should watch the results of such work in a proper manner and publicly assert such results through the press thus raising public sentiment in their behalf.

In our last issue we reprinted an abstract of the Wisconsin State by-laws, which dealt with this matter of licensing men to engage in the craft. This country as a whole should take the matter up and in earnest too. The members of each association should also take it up and approach the health departments, provincial and municipal and later on the federal. It is by such sentiments being voiced that our laws are made. Several years ago the writer voiced his opinion that a federal Department of Health should be formed, that the Government spent Millions of Dollars on Military affairs but not a cent on sanitation.

However, since then Death has made quite a number of calls and has been heard. Hence at last the powers that be have been made to see the necessity of taking strenuous steps in the cause of sanitation. Our universities no longer think sanitation a secondary consideration which can be thrown in along with a civil engineering course of education. They are approaching the Government in ways so as to have separate studies made and taken, of sanitation.

Practical Men Need Theory.

If such studies become universal, our practical men need to take heed and set aside more time for study. We know of scores of men who can instal and layout splendid practice, in the sanitary engineering line, but when asked "why they do and so" in "such a way" they have no idea why.

However, we have had a case brought before our notice where a public institution has had sanitary engineering installed in about as non-practical a way as could be desired. We did intend to reproduce the drawings, but time would not permit. So we shall have the whole

matter before our readers in our next issue. Here is a case where a man is placed in a position as plumbing inspector who has never done one single day's work at the trade. This particular case is one where a fairly competent man laid out the work and specifications, etc., but, these plans and specifications were not even followed out. Now in all fairness to the man who is the inspector, we must state he is being done an injustice by being allowed to fill a position which requires knowledge he does not possess. Then if our rising generation is to be strong and healthy the work done should pass the most rigid inspection which should be conducted by practical efficient men.

Poor Sanitation in Public School.

This case which we cite was actually a public school, a place where our children are to be occupying for practically 25 per cent. of their lives from the ages of 5 to 15.

The public should be enlightened in such matters as these. They should have the press voice such a state of affairs. They should be shown the difference between a good installation and a poor one, and should demand a practical man's opinion, some years ago there was a large number of men known as quack doctors. They could cure every disease under the sun that humanity was air to. Their "dope" was taken in pailsful or, if the nature of the remedy required salve, in lbs. However, they had their day. The public began to be more enlightened.

They began to see that none but a medical practitioner was a safe person to trust the curing of our ailments to. This was brought about by the medical men working in harmony and working hard too. So we in this calling require to work hard. In fact, we should absolutely refuse to instal work unless a properly qualified man is placed in a position to inspect and pass our work. We hold to-day a far more responsible position than the medical faculty, for the simple reason that we have to instal and plan the intestines of the home so that they will be a preventative of those ills which are proved to be caused by unsanitary conditions. The medical faculty are well banded together and when we are sick, we consult the best we can, we never take into consideration the price. We must have the best. Then if such be our stand, why allow botches to be the real cause for our having to consult these men. Sanitation will, if properly studied eliminate the cause of our sickness. If practical men had been consulted years ago regarding our water supplies, we should not to-day be called upon to lose our dear ones by typhoid, at least not to such an extent as we are doing, and it is the same with the installations in

our homes. This is not only an economic measure but a necessity to the health of the occupants of our homes and public places.

The medical faculty have done a great deal for the human race by proving the cause of our epidemics and other diseases which in former days were thought to be a judgment from our Maker. Now we know the chief causes have been and are the lack of proper sanitation. Hence, we should follow out that knowledge by seeing to it:—

First, that all those engaged in putting sanitary, heating and ventilating appliances are thoroughly qualified, that they do not engage in the trade unless they have studied and practiced the work and have passed certain degrees of efficiency.

Second, That all work must pass a most rigid inspection and be passed by a highly qualified man, a man who by earnest study and practice has become an expert in his line, a man too who is at heart a sanitary engineer and whose sentiments are such that he cannot be bought and sold by that class who try to slip over poor work on the public. Watch our article in next issue and our readers will scarcely believe that such a job actually passed inspection and is at present doing duty in one of our Canadian public schools.



EDITORIAL COMMENTS.

Strength comes only from well directed toil and concentration.

* * *

Were you at the association meeting last week? If not, why not.

* * *

There are those who think, there are those who don't think. Think.

* * *

If your mouth needs exercise, Don't Knock, but chew gum and think some.

* * *

DON'T WHINE.

" 'Taint no use to sit and whine,
When the fish 'aint on your line,
Bait your hook, and keep on try'n',
Keep a-going.

* * *

THE QUICKER WAY.

All things come to him who waits,
P'raps that's true. Well, let 'em.
As for me the things I got,
I had to go and get 'em.

Don't forget to attend your association meeting

Why Winnipeg Demands the Main House Trap

Several of Our Readers Sent Us Enquiries Asking if We Could Show in Some Concrete Manner the Reason for Winnipeg Reverting to the Use of the Main House Trap—Here is Shown the Reason.

From time to time several members of the craft have wished for information re the stand taken by those of our craft in Winnipeg on the main house trap question. Hence we wrote James Smith, chief inspector of the sanitary engineering dept., Winnipeg, and have pleasure in re-producing his reply which deals with the problem in a very forceful manner.

Editor Sanitary Engineer:

Dear Sir.—Your favor of the 25th inst., duly received, requesting information regarding Winnipeg's action in reverting to the use of house traps. This matter has been thoroughly dealt with by one of my assistant inspectors, R. J. Thomas, lecturer on "Plumbing" at the Technical School, in a paper on "House Traps" read at the convention of the Canadian Institute of Sanitary Engineers held in Winnipeg last April and which has been published in all the trade papers on the continent including The Sanitary Engineer.

For a number of years prior to March of this year the insertion of the house trap was optional in Winnipeg and at the end of 1912 there were over 10,000 untrapped drains connected to the sewers, most of these untrapped systems were in the outlying districts of the city where the sewers were mostly of relatively small diameter (from 12 in. to 30 in.). The object in removing the house trap is to eliminate the obstruction to the flow of sewage and also allow a free circulation of air through the drains, etc., from the main sewer to the outlet of soil pipe at roof. In Winnipeg, however, it was found that when the house trap was dispensed with the air passing down through the manholes on streets and up through the plumbing systems lowered the temperature of the sewers during the winter to such an extent that in a period of 15 months 129 frozen house sewers were reported at the plumbing inspector's office, and there were probably as many more not reported. In the same period of time 75 main sewers were frozen, some measuring 2 ft. 6 in. in diameter and ranging in depth from 8 to 25 feet below the street level. The house sewers frozen were with few exceptions close to manholes.

It will thus be seen that we are using the house trap simply to prevent free circulation of air through the house sewer, a very poor practice, but one that seems justified until some improv-

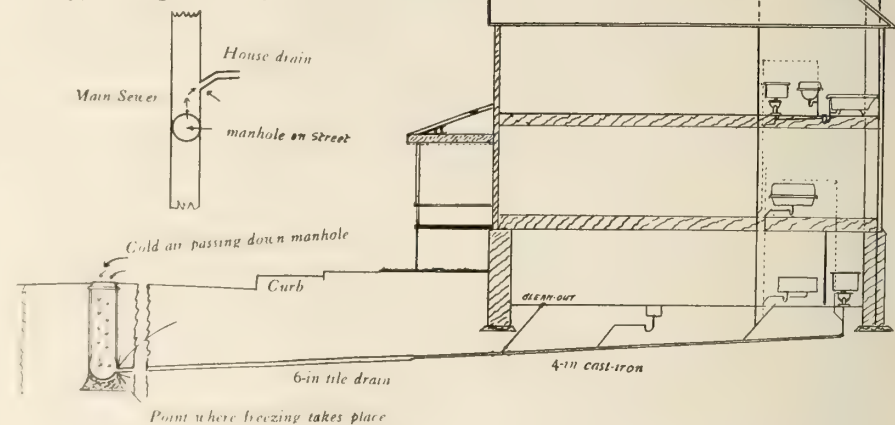
ed scheme of ventilating the main sewers than by open manholes on the street is discovered.

Some years ago a departmental com-



JAS. SMITH,
Chief Inspector of Sanitary Engineering, Winnipeg.

mittee of the House of Commons was appointed to inquire into the merits and demerits of the house trap. This report issued about two years ago is the last word on the subject and proves statistically, and practically that the house



Showing where freezing of sewers take place in Winnipeg.

trap is an abomination to be avoided in the British Isles at least.

I enclose a sketch which will help to a better understanding of the subject.

Yours truly,

JAMES SMITH.

It will be seen by Mr. Smith's letter that it is simply a case of climatic condition which forces the use of the main house trap.

They are not approved of on general principles by any means. Thus we must hope that a suitable method of ventilating the sewers other than through the open grate of the manholes will be evolved and we feel that Mr. Smith as

well as the craft as a whole will hail with pleasure any such scheme, which if proved practical would we feel be adopted.

We have, herewith, reproduced drawing sent us by Mr. Smith which too speaks for itself and shows exactly the trouble our Winnipeg fellow craftsmen are having to cope with.



PRACTICAL WATER, AIR AND SMOKE TESTS.

(Continued from page 12.)

The pressure applied to the work by this test is about 1 to 2 ozs. per square inch.

In making this final test the inspector should be specially careful. Unscrupulous workmen are to be met with in all towns and cities and it is an easy matter to deceive an inspector who is not quite on to this work.

It is generally an easy matter to detect these stunts. The inspector becomes

accustomed to try each job for the amount of compression and he soon becomes aware of the fact if the whole job is not under test.

It is an easy matter to determine a leak under this test but it is often a very difficult matter to detect where the leak is, especially when same is caused by nails driven into lead waste pipes which are covered over with two thicknesses of flooring between which is laid paper or deafening.

It is not necessary to use smoke for the test unless a leak is indicated. Air is quite as satisfactory and saves time, for both inspector and plumber.

New Sanitary and Heating Goods

A NEW DEVICE FOR FLUSHING.

During the past few years there has been a marked evolution in sanitary appliances and accessories, the trend being toward simplicity of design and con-

struction. One of the most conspicuous examples of this tendency is the gradual abolition of the toilet flushing tank, with its complicated mechanism, in favor of the flushing valve. But while the flushing valve, by its neat outward appearance conforms to modern ideas of sanitary equipment, its advantages have heretofore been offset by several serious mechanical objections. To overcome these objections an extremely simple flushing valve, known as the "J-M Valve," has just been put on the market by the Canadian H. W. Johns-Manville Co., Limited, Toronto.

This device is designed for use in connection with toilets, slop sinks, etc. It is furnished in three sizes: $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$ -in. and is guaranteed to control the flow of water and give a proper flush and refill where the water pressure at the valve is 10 lbs. or more. It can be installed in any position, upright, horizontally or at an angle, without interfering in any way with its satisfactory operation.

The sectional illustration herewith (Fig. 1) together with the following detailed description, will give a clear idea of the principle on which this valve is constructed. The operation is simplicity itself, and is entirely automatic after the button A has been pressed. This action carries the valve stem 5 against the flow

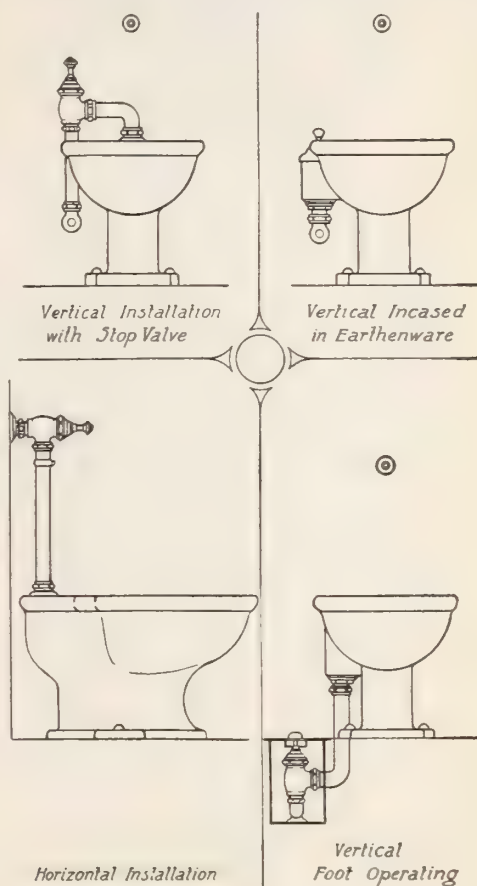


of water, and opens up the valve B so that water passes through the valve stem chamber and into chamber C. Leakage of water from chamber C is prevented by the cupped leather D being forced against the side of the cartridge E. As the water in chamber C increases, it has greater pressure area on the surface of plunger F than is presented at the valve G. Consequently this pressure forces the plunger F downward or against the source of water, until valve J closes upon seat K. The valve thus remains closed as long as button A is depressed due to the greater pressure of water upon plunger F before mentioned. When button A is released the valve B regains its seat, closing off the water supply of chamber C. The pressure of the water supply then acts upon the bottom of valves B and G, forcing them upwards, and relieving valve J from its seat K. At the same time the water previously imprisoned in chamber C is driven out through the by-pass valve M. Before valve G regains its seat and shuts off, the water for flushing passes

A WASHERLESS FAUCET.

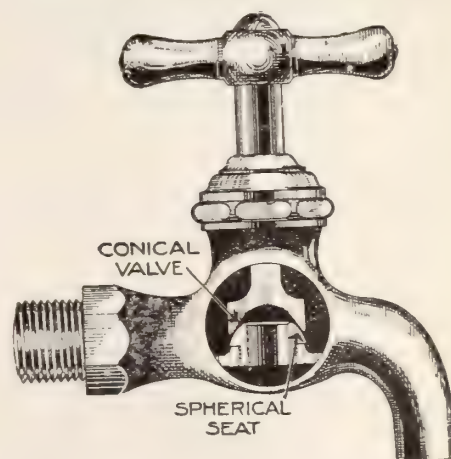
For years the plumbing profession has been waiting for a washerless faucet. The advantages of such a faucet are numerous. First and foremost, by preventing leakage, it puts an end to water

waste—and the conservation of water is one of the big questions of the day. While it would be impossible to estimate closely the amount of water wasted through leaky bibbs and cocks, it is safe



to place the figures at close to several millions of dollars a year.

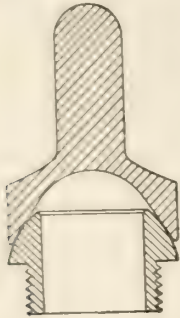
One city with a population of 240,000 rewashed 356,210 faucets in five years;



the water waste could not be estimated.

In addition to the enormous water waste against which municipal authorities throughout the country are waging an educational war, there is to be con-

sidered the cost of re-washing. This, too, runs into high figures. In many instances, it is necessary to re-washer faucets every week or two. And yet, no plumber really benefits in a substantial way by this work, as re-washing jobs are, in a large majority of cases, "accommodation" jobs which must be done close to cost.



A leaky faucet not only destroys the washer but the seating also, and eventually the entire faucet must be replaced.

Aside from being an expense the leaky faucet is a universal source of annoyance. And furthermore, the constant dripping often causes permanent discolorations in porcelain tubs and sinks.

The washerless faucet described below is therefore a great boon both to the consumer and the sanitary engineer. This faucet is entirely different in principle from any other on the market—it is the only faucet with a conical valve or jumper bearing directly on a spherical seating, see Fig. 2. With this seating, leakage is absolutely impossible, as the contact between a spherical surface and a hollow enveloping cone is in every possible position a true circle. This principle enables the valve of the new faucet to find a true seat, even when the top action of the cock is not actually true with the body. In applying this seating the ideal line contact is obtained, and there is no possibility of cutting.

Owing to its peculiar form of construction, it is impossible for solid particles to remain between the valve and seating when closed. And as no washers are used, the destruction of seatings by chemical action due to the use of leather, rubber, etc., so common in ordinary valves, is entirely eliminated.

The valve and seating form a separate unit in themselves, and are easily and quickly removed should it ever become necessary.

Other features of the new faucet, are the absence of hammering, and also the absence of whistling under high pressure. Operates as well on high pressure as on low, and is equally efficient on hot and cold water lines. It is quick and easy in action, shuts off dead, and doesn't splash.

This Faucet is an English patent and has been in successful use in Great Britain and other countries for years, where

it has become famous for its dependability.

Many prominent engineers pronounce it the most perfect faucet on the market, and its merit is fully demonstrated by the fact that it is authorized by the Metropolitan Water Board of London and other cities.

This faucet is now being manufactured in all standard American forms by the Canadian H. W. Johns-Manville Co., Ltd., Toronto and New York. All parts are interchangeable and guaranteed free from flaws and defects. Under average conditions the makers claim that this faucet will last a lifetime and each seating is guaranteed for a period of ten years.

The above named firm has just issued an interesting booklet describing this remarkable faucet in detail, and will gladly send a copy to anyone interested.

Drinking Fountain Attachment.

The Empire Brass Mfg. Co., Ltd., of London, Ontario, have recently put on the market a new attachment in the form of a sanitary drinking fountain apparatus. They claim where a drinking fountain apparatus is to be installed it is a matter of taking out the old fixture and installing a new one at considerable cost. This attachment can be



fixed on to a bibb with a hose end and the water turned on and off in the usual way. They claim it to be a very valuable attachment to any factory as it does away with the unsanitary drinking cup at a very small expense. The same may be said about its use in public schools. Further particulars may be had by writing to the Empire Brass Mfg. Co., Ltd., London, Ontario.

Pumping Machinery.

The Chicago Pump Co., have recently issued a very interesting booklet which is known as catalogue F. It is strongly got up and is composed of some very interesting data. It also deals with their full new line of electrically driven and controlled pumping machinery. These booklets should be in the possession of all up-to-date sanitary and heating engineers, and can be procured by writing to Messrs. Chicago Pump Co., 904-910 West Lake street, Chicago, Illinois.

Connecting Waste Pipes.

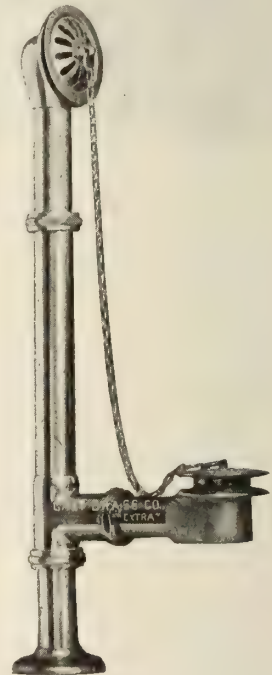
The Lafrance Improved Pipe Joint Company, Limited, have issued a very interesting book on new methods of con-

necting waste pipes to the cast iron soil pipe. They claim to have been able to reduce cost and increase the efficiency over the method as present so universal. Those in the trade who would like to procure one of these books may do so by writing the Lafrance Improved Pipe Joint Co., Ltd., 1165 Carrieres Street, corner of Iberville, Montreal, Que.



Lafrance Method of Joint Making.

The Galt Brass Co. are now placing on the market a new bath-waste and overflow, which will be known to the trade as the AJUSTO Bath Waste and Overflow. It has many novel features embodied in its make-up, the fittings are all heavy cast brass, well and truly machined. It can be adjusted easily, thus



deriving its name from that feature. The fittings too are recessed so that none of the tubing can be pushed too far in and thus blocking up the waste passages. The Galt Brass Co. stand back of this article with their usual guarantee.



Ottawa, Ont.—The Campbell Steel & Iron Works, Ltd., makers of structural steel, boilers, tanks, etc., have commenced work on an addition to their plant, which will double their capacity. All machinery has been purchased.



The Question Box

Subscribers are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks are Also Invited.



CHANGING HOT WATER TO STEAM

Editor, Sanitary Engineer —I received your answer to my inquiry concerning the changing of a hot water system to steam, and have herewith enclosed a rough sketch of elevation plan of factory and boiler and house with hot water system in. The water line of steam boiler is about 3 ft. below the lowest radiator, and 1 ft. below the lowest return pipe, in the basement.

The pressure at the factory varies from 10 lbs. to 60 lbs. The owner wishes to dispense with a regulator if possible.

What I really wish to know is, would the steam work satisfactorily in the layout of a system of hot water piping. Of course the owner wishes to be able to

use the hot water system as before if necessary, so that if steam was turned off all would be left in readiness to fill up the furnace with water and run as before. Thanking you for past favors and hoping you can let me hear from you at an early date, I beg to remain,

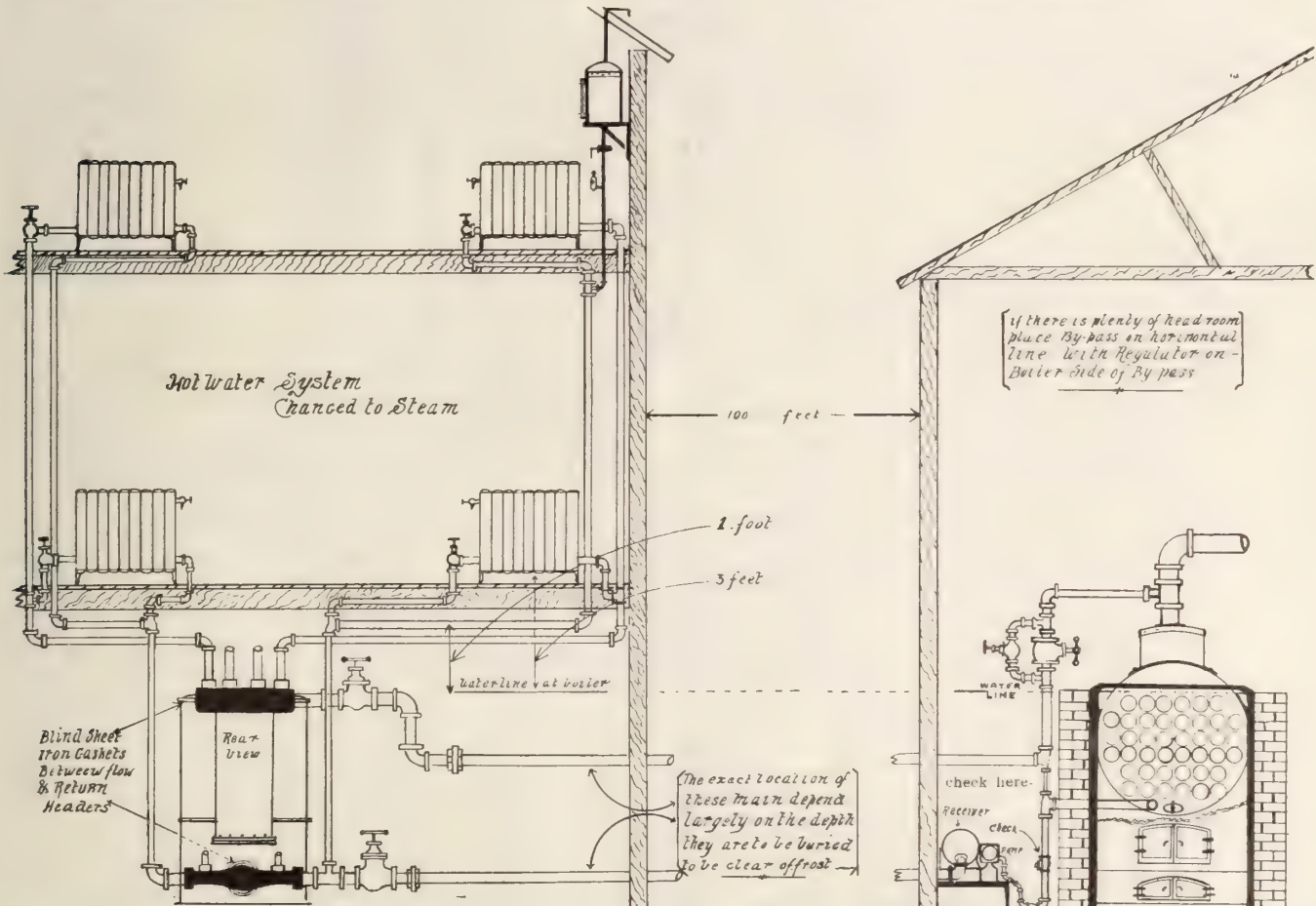
Yours truly,

A Subscriber.

In answer to subscriber we beg to state we are here producing a cut of his sketch along with a plan which considering the particulars, is as near as we can inform him. It may be stated, however that, providing he can take care of the necessary drips and get his return condensation to the steam boiler, the piping of a hot water system will work alright. Of course he would need

to be sure and have a good stop valve on the expansion pipe anywhere above the highest radiator, and also place a good thermostatic air valve just below the stop valve mentioned. Then regarding the connecting of the steam and returns to the hot water system, it would not be advisable to allow the steam to go into the furnace by any means as it would act as a condensor and thus prevent the best satisfaction being got out of the steam.

The proper way would be either to put a valve on each main and make a by pass header or put in a pair of sheet boiler plate blind washers with a sheet of good rubber between each connection where the headers join on to the hot water furnace.



Change of hot-water system to steam. Using steam from power plant 100 feet away.

Then put a valve on the main flow and return, viz., 2 valves only. Now coming back to the steam regulator question. The writer once had a job where a pair of large boilers (steam) were equipped with a regulator and somehow or other it did not give satisfaction. The steam carried was a constant 40 lbs., at least it never varied more than 2 lbs. higher or lower, and steam could not be got into the radiators at times. So the writer placed a 2 in. valve and by-pass on the steam main which was an 8 in. one and very seldom had it opened more than half way. This is working to-day with of course a pump and receiver at the boiler. Conditions may be such in subscriber's case that the same method may work, but a good regulator is the proper thing and particularly seeing there is such a great variation on the pressure for two reasons: 1st, almost guaranteed satisfaction; 2nd, safety as it would never do to put 60 lbs. of steam into a hot water system, thereby straining the cast-iron radiators with such a pressure.—Editor.

ADDING COIL AND RADIATOR TO RANGE BOILER.

Editor Sanitary Engineer.—A friend of mine wishes to put a coil in his hot air furnace and connect the same with range boiler which of course is connected with the kitchen stove already.

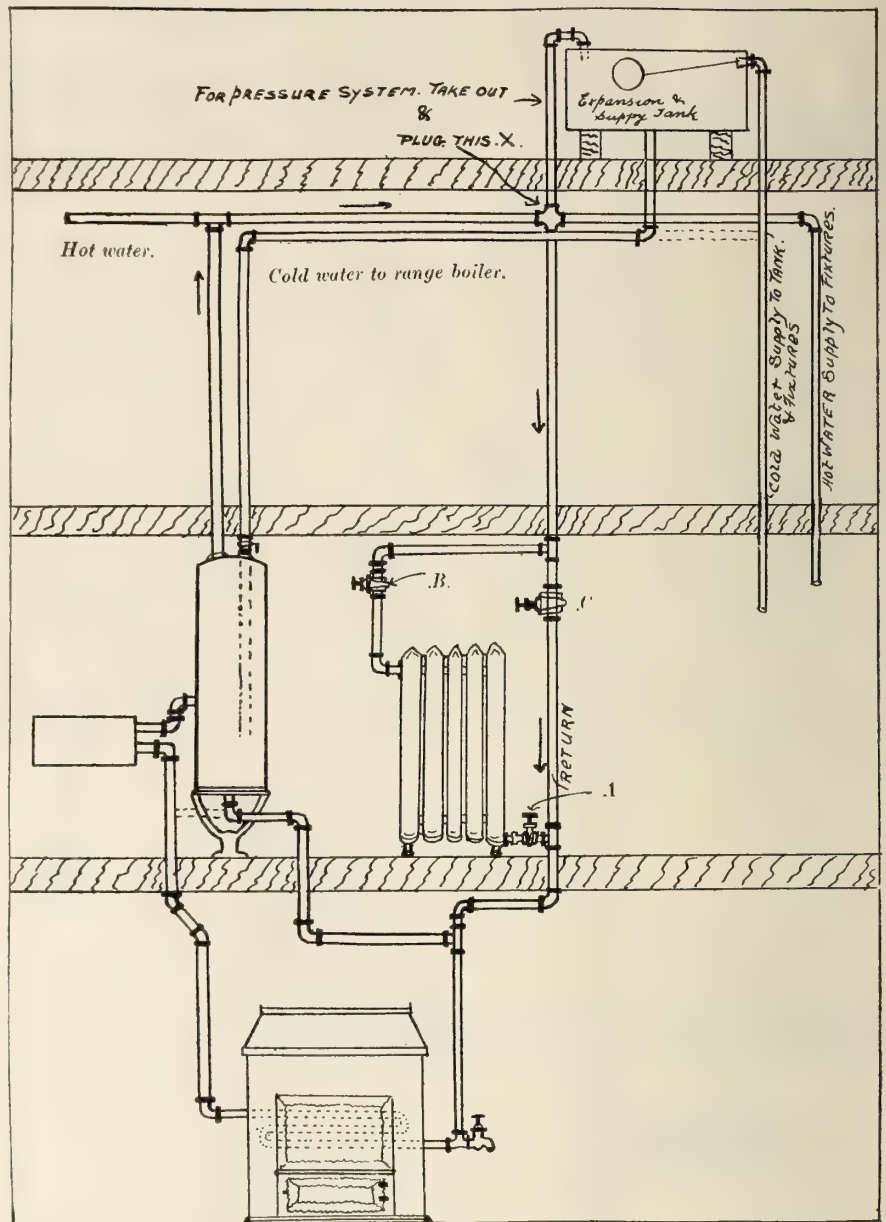
He also intends connecting this system with a radiator in the hall. As water supply is from town pressure there would be no expansion tank, do you think this would work alright.

PLUMBER.

In answer to plumber's question we may state it may work alright if connected on a circulation plan, but we would not advise it as the pressure would be too hard on the radiator. However we have produced a drawing how it should be piped. In the first place an expansion tank should be placed in the attic and the piping run as we have here shown with the valves in position to control the radiator, and whether this was a pressure job or not the valves should be so placed. However, if it was decided not to put the tank in it would simply be necessary to instal the piping as shown excepting the piece which acts as expansion pipe and the piece which enters the bottom of the tank. Then have the coil supply pipe connected as per the dotted lines shown below the expansion tank. It will be seen that on the general principle, when the range was in use only in summer time the water would have to circulate down through the coil in the furnace. However, this also could be eliminated by connecting the two pipes as shown in dotted lines. This pipe would need to have a valve on

it to close when the furnace was in use as well as the range, all valves should be gate valves and all unions should be metal to metal. In conclusion may state we much prefer the expansion tank installation. In fact the practice of put-

tion and should be in the possession of every sanitary and heating engineer. This catalog can be procured by writing to Messrs. H. Mueller Manufacturing Co., Ltd., Manufacturers of High Grade Brass Goods, Sarnia, Ont.



Showing how to connect radiator on to hot-water service system.

ting range boilers on town or city pressure is wrong. The life of a boiler is shorter and it has been found to be unsafe when a fire happens in the vicinity as the city pump house generally puts on more pressure on that section, thus straining the range boiler to no small degree.

Mueller Co. Catalogue.

The Mueller Manufacturing Co., Ltd., Sarnia, have issued a new and beautifully gotten up catalogue in the form of a well bound and indexed volume. It contains 860 pages of very useful infor-

NEW SEWERS.

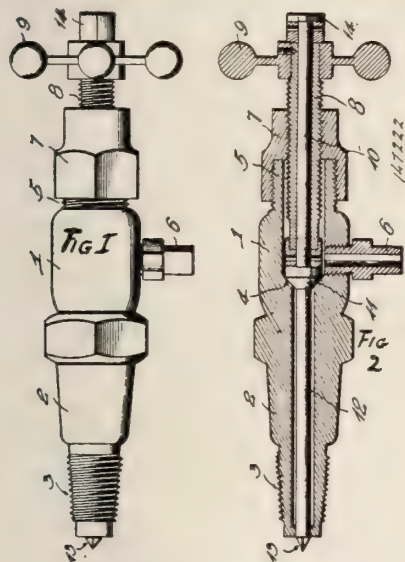
Ingersoll.—Plans of Ingersoll's proposed sewerage system have been submitted by Engineer Thorold, of Toronto. They call for a total expenditure of \$59,000. The plans have already been approved by the Provincial Board of Health, and have also been discussed by the town council at a special meeting. It is the intention to have a consulting engineer go over the plans before their final adoption. The sewerage system has been on the slate for some time, and is one of the big problems that will have to be solved at an early date.

New Canadian Patents

No. 147,222.

George M. Wolfe, Chicago, Illinois, U.S.A., 8th April, 1915; 6 years. Filed 6th November, 1912. Receipt No. 216,479.

Claim.—A gauge cock comprising a body having a valve seat at an intermediate point, and an aperture in its upper end and also having a smooth and unobstructed bore between said valve seat and aperture, a nozzle communicating with the interior of the body immediately adjacent the valve seat, a longitudinal sleeve having a threaded exterior connected with the body and also having a smooth bore, a handle fixed on the outer portion of said sleeve, a valve opposed to the valve seat and the inner



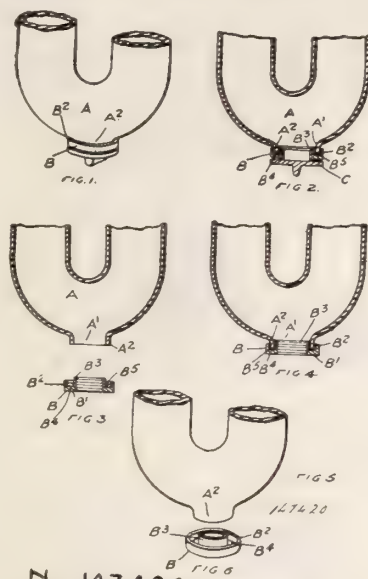
No. 147,222. Cock.

end of the sleeve and having a stem extending through and beyond the sleeve and adapted to be turned about its axis in said sleeve and also having a smooth stem extremity, of considerably smaller diameter than the smooth bore of the body, arranged in said bore and aligned with the said aperture in the inner end of the body, and means fixed on the sleeve handle, and constructed for turning of the valve independently of the sleeve.

No. 147,420.

The Canadian Metal Company, Limited, assignee of William Gean Harris, both of Toronto, Ontario, Canada. 2nd April, 1913; 6 years. Filed 30th August, 1912. Receipt No. 213,885.

Claim.—In a solder joint clean-out for lead traps, the combination with a lead trap having at the apex an orifice provided with a suitable edge, of an an-



No. 147,420.

Solder Joint Clean-Out for Lead Traps.

nulus of comparatively hard metal forming a trap screw and internally threaded and provided with an annular channel adjacent to the edge of the opening and surrounding the same, and a filling of solder between the edge of the opening and the sides of the channel, as and for the purpose specified.

No. 146,689.

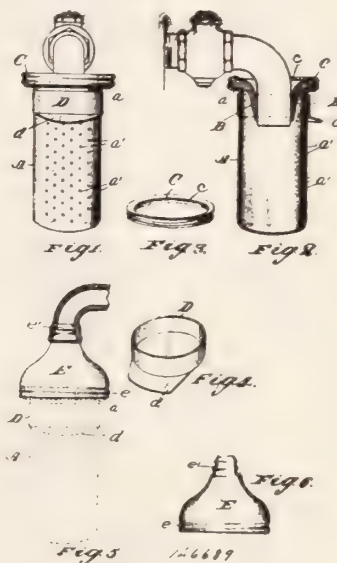
Theodore G. Fishel, New York City, New York, U.S.A., 18th March, 1913; 6 years. Filed 15th October, 1912. Receipt No. 215,544.

Claim.—1. A device for spraying water or other fluids comprising a receptacle or container consisting of a short tube provided with spraying openings, which is closed at its bottom end, and has an inlet opening in its top, means for attaching said tube to a faucet, or other source of fluid supply, and a deflector arranged to regulate and control the spraying of the fluid, said deflector being carried by said tube.

2. A device for spraying fluids comprising a receptacle or container adapted to receive and contain cleansing, medicinal or other substances and to be attached to a source of fluid supply, said container being closed at its bottom end and having an inlet opening at its top and provided with spraying openings in its front wall.

3. A spraying device for fluids comprising a short tube having spraying openings which is closed at its bottom end and has a top provided with a central aperture, an elastic bushing held in said aperture between said top and the upper end of the tube giving free access to the interior of said tube, and means for regulating and controlling the spraying of the fluid.

4. A spraying device for fluids comprising a receptacle or container consisting of a short tube provided with spraying openings which is closed at its bottom end and is provided with an inlet opening in its top, means for attaching said tube to a source of fluid supply, and a deflector slidably mounted on said tube



No. 146,689. Sprayer.

arranged to regulate and control the spraying of the fluid.

5. A spraying device for fluids comprising a tube with spraying openings and an enlarged upper end, an elastic bushing seated in said enlarged end of the tube and held in place therein by a top which has a central aperture giving access to said tube, and a deflector slidably mounted on said tube and held by frictional contact thereon.

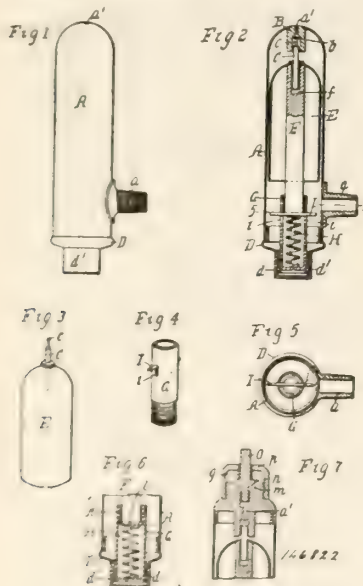
6. A spraying device for fluids comprising a tube with spraying openings and an enlarged upper end, an elastic bushing seated in said enlarged end and held in place therein by a removable top on said tube which has a central opening giving access to said bushing and said tube, and a deflector adjustably mounted on the outside of said tube.

No. 146,822.

George Bass, assignee of Charles H. Simmons, both of Chicago, Illinois, U.S.A., 25th March, 1913; 6 years. Filed 23rd January, 1911. Receipt No. 192,004.

Claim.—1. In an automatic air valve, the combination of a valve casing provided with a valve seat, of a rigid thermostatic member, a valve carried by the upper end thereof, a supporting spring on which said member rests, a socket in which said spring is supported and which is adjustable in the valve casing toward and from said valve seat, and a stop which limits the movement of the free end of the spring toward the valve seat, substantially as set forth.

2. In an automatic air valve, the combination of a valve casing provided with a valve seat, of a rigid thermostatic member, a valve carried by the upper end thereof, a supporting spring on which said member rests, a socket in which said spring is supported and which is provided with longitudinal slots, and a transverse supporting bar



No. 146,822 Air Valve.

for said member movably arranged in said slots and held in its normal supporting position by said spring, substantially as set forth.

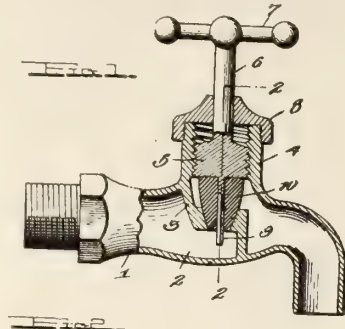
No. 147,462.

Austin F. Schmidt and Robert W. White, Jr., co-inventors, both of Baltimore, Maryland, U.S.A., 22nd April, 1913; 6 years. Filed 13th September, 1912. Receipt No. 214,822.

Claim.—1. The combination with a valve stem having a reduced lower end, a hollow body, a web dividing the body and having a valve seat therein, the reduced portion of the valve stem projecting through the valve seat and adapted for vertical movement therein, said hollow body having an interiorly threaded

neck portion, said stem having a threaded enlarged portion for engagement with the threads of the neck portion of the hollow body, of a conical valve member rotatably and slidably mounted in the reduced portion of the stem and having its smaller lower end engaged through the valve seat while the upper end bears against the threaded enlarged portions of the stem, means for closing the upper end of the neck, and means for rotating the stem.

2. The combination with a valve stem having a reduced lower portion, a hol-



No. 147,462. Faucet.

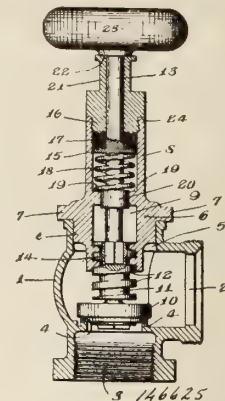
low body, a web dividing the body and provided with a tapering valve seat, the reduced portion of the stem projecting through the valve seat, the hollow body having a neck portion, the upper portion of the stem being threaded in the neck portion of the body, of a conical flexible valve member removably positioned upon the reduced portion of the stem and adapted for reciprocation and rotation upon said lower portion of the stem, said valve member being normally engaged through the valve seat and adapted to be raised and freely rotated by water pressure when the valve stem is in raised position, and means for closing the upper end of the neck.

No. 146,625.

The Syracuse Faucet and Valve Company, assignee of John B. Woodworth, both of Syracuse, New York, U.S.A., 18th March, 1913; 6 years. Filed 22nd November, 1912. Receipt No. 217,190.

Claim.—1. In a valve, and in combination, a body having a valve seat and an opening through its wall opposed to the seat, a cap mounted in the opening and provided with an axial passage therethrough, an abutment in the passage intermediate of the ends thereof, a valve within the body for co-acting with

the valve seat, a valve stem extending through the passage in the cap and having one end detachably connected to the valve and its opposite end provided with



No. 146,625. Valve

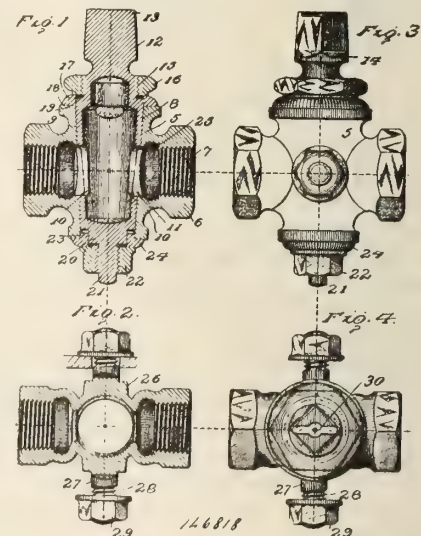
a handle, a closure for the outer end of the passage in the cap, said closure including a part extending a distance into the passage.

No. 146,818.

Aaron J. Tyler and Howard L. Bidelman, assignee of a half interest, both of Rochester, New York, U.S.A., 25th March, 1913; 6 years. Filed 2nd January, 1913. Receipt No. 218,616.

Claim.—1. A valve including a casing having oppositely disposed trunnions for attachment to a support and provided with a valve seat and a valve engaging said seat.

2. A valve including a casing having oppositely disposed threaded trunnions for engagement with a support and pro-



No. 146,818. Valve.

vided with a valve seat, a valve engaging the seat, and clamping nuts threaded on said trunnions and adapted to engage the support for preventing tilting movement of said casing with respect to the support.

Sanitary Engineers and Building Construction

Showing to Which Department of the Civic Office the Sanitary Engineer Should be Attached, and His Relation to the General Construction of Buildings and That the Architect, Builder, Structural Steel and Sanitary, Heating and Ventilating Engineer Should All Have Their Place on the Boards of Health, etc.

There has been considerable discussion recently as to which department the plumbing inspector should belong: The building inspection department or the Health Office.

In some towns it was decided he should be attached to the building department and be under the direction of the building inspector. We have not found out as yet any adequate reason for such course. The Health office, as a matter of fact, should be at the head of the Building Inspection Department for various reasons which we herewith submit.

In the first place a building should be constructed in such a way as to provide facilities for a proper spontaneous system of ventilation. How many buildings are there to-day which, because of their poor construction are difficult to properly ventilate? We may venture to state that such is the case with at least nine-tenths of them. In these days of speculation there are houses being built which, if the Health Office controlled matters, would not be built. There are houses with no provisions for any ventilation whatever. The building inspector is not asked whether there is such provision made or not, he is only interested in the general construction, not the sanitary construction.

An Unsanitary Structure.

Several years ago a case came to our notice where an apartment house was built which included 19 suites of apartments with 19 bathroom installations, and no less than 13 of these bath rooms had no access to the outside air. Now the plans passed the building committee without a single objection and the sanitary inspector knew this, but at that time had no by-law behind him to disallow such a permit being granted, hence, of course, the building was put up and is in existence at present. This is only one case which we cite, but it is enough to prove what actually happens and is being repeated every day in some of our cities.

Building for the Future.

When a person wishes to build a residence, a speculative builder wishes to erect a building or a company requires a factory or place of business, they generally call upon an architect, and during consultation, first one room and then another is planned to occupy certain portions of the building. Then comes a

discussion regarding the sanitary and heating arrangements but no mention of ventilation. The bathroom is actually the last to be considered. The location of the boiler or furnace is the last matter to receive attention and in 99 cases out of 100 the general layout is not only poor but altogether wrong if proper sanitation is to be considered. Up to the present day the architects have held sway to a certain extent. They are mostly to be blamed for catering too much to the whims of the ignorant public as a whole. They have catered to the people who wanted fancy homes which cannot be made sanitary or even heated properly, not to speak of ventilation. Architects have, up to the present day, undertaken to plan heating equipments as well as the sanitary engineering when this line was far beyond their abilities to accomplish. They and they only are to be credited with the poor installations which at present flood the country and why? Simply because they

Are Not Sanitary, Heating or Ventilating Engineers.

The day is past when we consult an ordinary medical practitioner for deafness, eyesight or dentistry. We have our family doctor whom we call in for our general ailments and if by chance we contract even tuberculosis, he advises us to get a specialist or sends us off to a hospital fitted out and equipped to deal with such cases. This is just what our architects should do. They should be honest, first to themselves and then to their patrons and admit first and last that the problems of heating and ventilating are out of their sphere, they would be able to devote more time to the study of architecture in every sense of the word rather than endeavor to accomplish a class of engineering which is beyond their ability to follow out. Now we do not feel we are unduly criticizing them in an unfair manner, because that is not our motive.

Progress Demands This Division.

Never was there a time when each separate line of calling should be more clearly divided. In our own line, for instance, the plumber was "a worker in lead." He wiped lead pipe joints. He lined wood tanks with lead and burned the joints. He made windows "leaded lights" so called at one time, he installed domestic pumps, in fact he was nothing more than a "worker in lead" in every

sense of the word. The writer was in conversation with a "plumber" the other day and asked him how long ago it was since he, "the plumber," did any lead burning or fixed a leaded window and he replied "over 30 years." There are very few to-day who do any lead burning. Again, look at the difference in the work he is called upon to do. Suppose he had stuck to those lines simply because he was called upon to do so, long ago, just as the architect is doing, where would he be? No, the fact is, if a customer went to a present up-to-date sanitary engineer and asked him to do such work, or to lead burn a window sash, he would be referred to the ornamental window specialist. Even the sanitary engineer is to be found in business to-day who does not practice heating engineering and vice versa.

Expert Knowledge Necessary.

Hence, "Sanitary Engineer" maintains that all plans of proposed buildings, whether residences, factories, warehouses or office buildings, should first of all be laid before the Boards of Health, these Boards to be comprised primarily of expert sanitary, heating and ventilating engineers, then structural engineers, and last, though by no means least, the architects.

It is not to be expected that an architect should know the different phrases necessary to make up specifications for structural steel work, or even sanitary, heating or ventilating engineering, or vacuum cleaning and several other feats of engineering. He is more of an artist in architecture than either of the aforementioned engineers.

It is the architect to whom we look for architectural beauty. Then, in turn, if any great quantity of steel is needed in a building we look to the structural steel engineer. For sanitary, heating and ventilating problems we look to the sanitary, heating and ventilating engineer, all of whom should be experts in each separate line.

Should Work in Harmony.

This method must come into force sooner or later if progress is to be given full swing. We should not feel hurt if we are called upon to give up certain lines of what used to be ours, but which on account of the progressive development and demands has taken on, as it were, a new distinct life.

We must work in harmony and see to it that each expert is given his own portion of responsibility, in that way our homes will be more beautiful and pleasant to our view. Our heating will be good; our ventilating will be all that our present day science calls for and our sanitary apparatus, too, will be all that can be desired. Further, these necessities, and they are nothing less, should be watched. They should be demanded by those experts who comprise the Boards of Health, and everything which is necessary to safeguard the lives, the health, and welfare of humanity should be under the authority of such boards. We would advocate all towns and cities paying first class men good salaries to superintend such works for the safety of the people. Bad heating and ventilating has generated more cases of tuberculosis than ever was caused by naturally weak constitutions. If half the wealth were expended on prevention, that is spent on cure, some of our physical ills would soon take to themselves wings and "flee away."

So let us see to it that if we want a residence, factory or office built, consult an architect, and if our building requires steel to any great extent, we should consult an engineer who follows that calling. In the same way, if we are to have sanitary, heating or ventilating in our requirements, then call in one who is an expert in such lines. Hence, the position we take is that sanitary inspectors should be a part of our Boards of Health and not under the direction of a building inspector. In another column we have reprinted a clipping from a paper which shows the stand which is being taken in that city, but there are several cities which have recently taken the stand that sanitary engineering should be under the jurisdiction of the building inspectors.

TRADE NOTES.

Regina.—The Regina Plumbing and Heating Company are making an addition to their warehouse.

Lennoxville, Que.—The Lennoxville Waterworks Co., through its superintendent, N. H. Greene, has offered to sell the waterworks to the town for \$34,000.

Victoria.—R. Smith, of Victoria, plumber and hardware merchant, has disposed of his hardware department to A. & H. Johns.

Welland, Ont.—The old waterworks plant is being repaired at a cost of \$500, and will be used as an auxiliary in the event of a breakdown at the new plant.

Regina, Sask.—The Regina Plumbing & Heating Co. have offered to instal a heating and ventilating plant in the General Hospital for \$42,460.

Vancouver, B.C.—The Royal Plumbing and Heating Co., have dissolved partnership. J. H. Simpson will carry on the business in future.

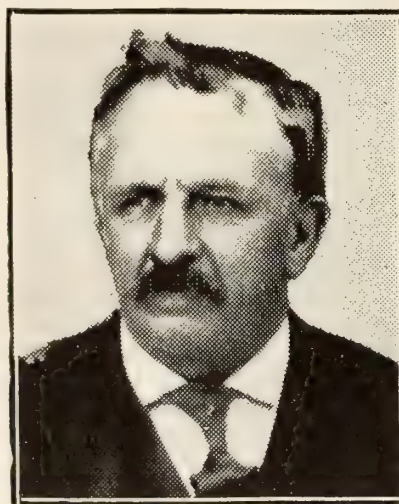
London, Ont.—Willis Chipman, of Toronto, and City Engineer W. N. Ashplant, last week outlined before the council a programme for carrying the \$400,000 storm sewer project through.

London, Ont.—The Ontario Railway and Municipal Board has dismissed the application of Swift-Greene, Limited, of London, to lay steam pipe across Carling Street for the purpose of supplying buildings with heat.



DEATH FROM HEART FAILURE.

After suffering from heart trouble for several months, Mr. Edward Larter died suddenly in his office, 501 Spadina avenue, recently. While telephoning he was seized suddenly with an attack of heart failure and dropped dead to the floor.



Edward Larter.

Mr. Larter was 55 years of age, and was born in Fergus, Ontario, residing later in Teeswater and Harriston before coming to Toronto 35 years ago, since when he had been prominently engaged in the heating and ventilating business. He was a member of the Maple Leaf Lodge Royal Arcanum.

He was also a member of the Domestic Sanitary, Heating and Ventilating Association of Toronto. Was an active worker and earnest advocate of good work in his line. Speaking to one of his brother members, it was stated that Ed. Larter would be missed by all in the craft who knew him. They one and all wish to convey their deepest sympathy to those whom he has left behind. His wife and four children survives him. Mrs. P. S. Linforth, Los Angeles; Mr. A. W. Larter, of Toronto; Miss Hazel and Mr. Norman Larter, of Edmonton.

MARKET REPORT.

Enamelware.—While there has been a fairly steady demand for this line. There is a tendency the demand will ease up a little now, as most of the 1913 contracts are on the point of completion.

The outlook is very encouraging as reported by the different salesmen, those who are visiting the smaller towns which have from 10,000 to 30,000 of a population seem to feel that trade is fairly good on the whole. This of course refers to the sanitary as well as the heating business. There is no change in prices reported.

Brass Goods.—No change is reported and as in the case with enamelware things are easing up a little. There is however the usual demand for repairs, etc.

Black and Galvanized Pipe.—This remains unchanged and demands are not so large just at present, most of the heating has been finished up, although on account of the openness of the season this line of work has kept steady for a rather longer period than usual.

Pipe Fittings.—Remains the same and demands are about the same as pipe, rather easier.

Soil Pipe and Fittings.—While there has been a steady demand for this commodity there is not the rush there was. Shipments are more numerous, but not so large in quantities. No change in prices are reported since our last issue.

Lead and Lead Pipe is still rather high in price and remains steady. No change is expected till about the turn of the year. Demands are fair.

Solder.—This is a shade higher in price and is expected to be unchanged for the rest of the year. Demands are easy too.

Collections.

There has been as we all know a rather general shortness of money this year. But, one or two large houses who deal in the sanitary and heating goods stated that when looking over the volume of turn-over for the period already past of this year, they found they had not suffered in the aggregate.

However, this lead them to see where they had held up. It was found that while in the large centres trade had really been poor, in the smaller towns and cities ranging in size of from 10,000 to 30,000 people, that trade had been in many cases even better. While in other cases there was a fair demand.

Not only so, but money had also been more plentiful than in the large centres. Taking a look back it has been found that as a whole the sanitary and heating business did not seem to have suffered a great deal.

Complete Course of Sheet Metal Work

By L. W. KOSER

Figs. 2, 3, 4, 5 and 6 show the detail through each part. For instance, Figs. 2 and 5 show the detail through the side A—A, as though the window had been sawed through and the top part removed. The detail then shows what we would see looking down at it. We see the brick walls, with the furring strips, lath and plaster, the way the window is held in the walls by means of flanges going back in the mortar lines between the bricks.

For a larger detail we then refer to Fig. 7, which shows these flanges the

way the metal is locked or folded at joints, the sash weights for hanging or counter-balancing the sash (shown by S. W.); the way the frame is moulded or shaped, and the way it is partitioned for the sash weights, which also serves as a brace.

The dotted line represents the runway for the sash, and can be placed in position after the frame is built into the wall by putting the runway and sash together and setting the whole in place, the flanges going into the recesses. 12 and 15 should not be too long, so they can be sprung back and slid over the face of the frame.

The detail at top would be practically the same as at the sides, with the exception that it can be formed in deeper to accommodate the size of pulleys used and the flanges can be formed in the frame instead of separate, as on the sides. The sill is formed from heavier metal than the other parts of it, it usually being 22 gauge iron (Birmingham gauge), while the other is usually formed from 24 gauge. The sill is made plain with a fall to the front of carry off the water and all the members of the side frame stop or butt mitre against, as shown by details, Figs. 3, also Figs. 7 and 8.

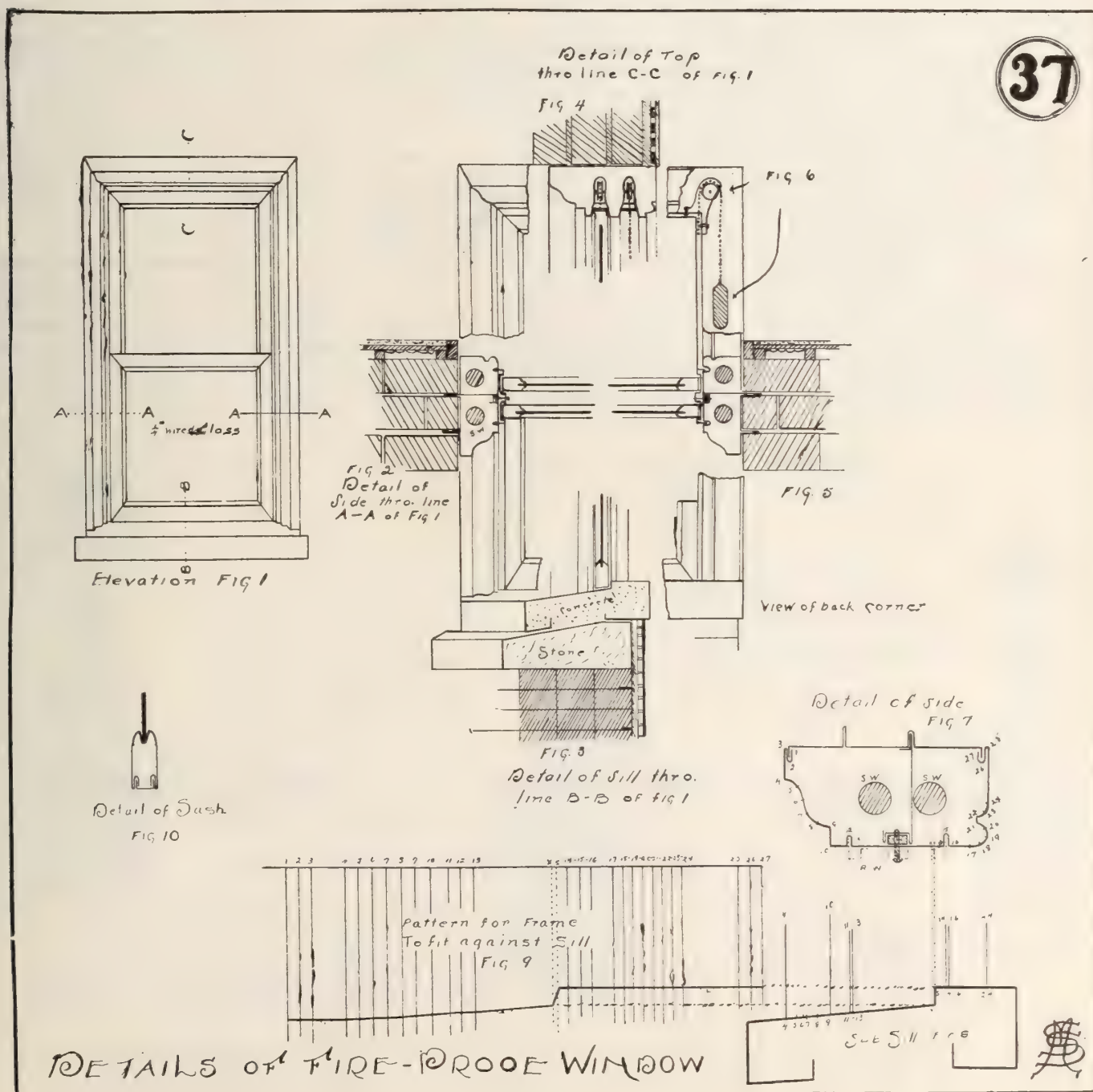


Fig. 6 shows how the sash pulley should be fastened to frame to carry the weight.

The mitres are simply butt mitres and square mitres, the butt mitre for frame joining sill being shown by Figs. 7, 8 and 9.

The joining must not depend on solder, but on lock seams and rivetted flanges. At the sill a slot is cut and the flanges shown by L on the pattern are inserted and bent over, soldered and riveted.

Of course, we do not expect the student to make fireproof windows, as it requires special machinery and appliances to make them, but we aim to make him familiar with this class of work, so if he ever goes into a big factory it will be easier for him to catch up with the good ones.

On plate 38 we show in detail some of the different kinds of metal roofing in use at the present time. For flat roofs either the standing seam shown by figs. 1, 2, 3 and 4 or the wood roll "Expansion" joint, shown by figs. 5 and 6 are more commonly used, the end joints being either riveted and soldered or double folded and locked together, the whole being fastened to the roof by means of cleats.

Fig. 1 shows a finished standing seam joint in which the dotted line represents the cleat, the cleat being shown dotted so as to avoid a confusion of lines. A perspective view of the cleat is shown by Fig. 2 and is simply a piece of metal about 3 inches long by 1 inch wide.

Fig. 3 shows the first operation of

forming the standing seam. The side "a" is first turned up $1\frac{1}{2}$ inch with a pair of roofing tongs. The cleat is next placed against it and nailed to the roof. Then the side "b" of the next sheet is turned up $1\frac{3}{4}$ inches and laid against the side "a."

Then "b" is folded down over "a," as is also the cleat as shown by Fig. 4, the whole is then given another fold over as shown by Fig. 1, which completes the joint, the operation being performed with a pair of roofing tongs or with a mallet and hardwood board.

The sheets for this class of roofing are usually made in rolls the full length of rafters, the end joints usually lapped, riveted and soldered. This is a very good style of roofing, and when properly laid will give perfect satisfaction, but great care must be used, for if the joints are not formed exactly as shown by Fig. 1 the roof is quite apt to leak. The expansion joint, Fig. 5, is used considerably for flat cottage-shaped roofs and accommodates itself easily to covering spaces requiring that different shaped gores be set in.

The detail shows the joint so clearly that no explanation is necessary, the one side being longer than the other so it can be folded back over the nail heads and the seams soldered at s and t, and the end joints being doubly locked as at Fig. 7.

The expansion joint shown at Fig. 6 is used for copper which can be easily bent and folded. This joint requires no solder, and when carefully formed it gives good satisfaction. It is formed as follows:—

The wood roll is first nailed to roof boards.

A cleat, as shown by the dotted line, is then nailed to strip and left sticking over the sides. It is then turned down and then up under the fold of roofing, the whole being then covered with a cap "C" running the full length of the roof and folded under the turned up edge of the roofing.

Corrugated iron, shown by Fig. 8, is largely used for barn roofing or for covering skeleton frames, such as warehouses, etc.

It is made from large sheets of galvanized iron (usually 36 by 96) formed in waves or corrugations, as shown by Fig. 8. These corrugations stiffen the sheet and allow it to span openings, consequently it saves the bulk of the wood sheathing.

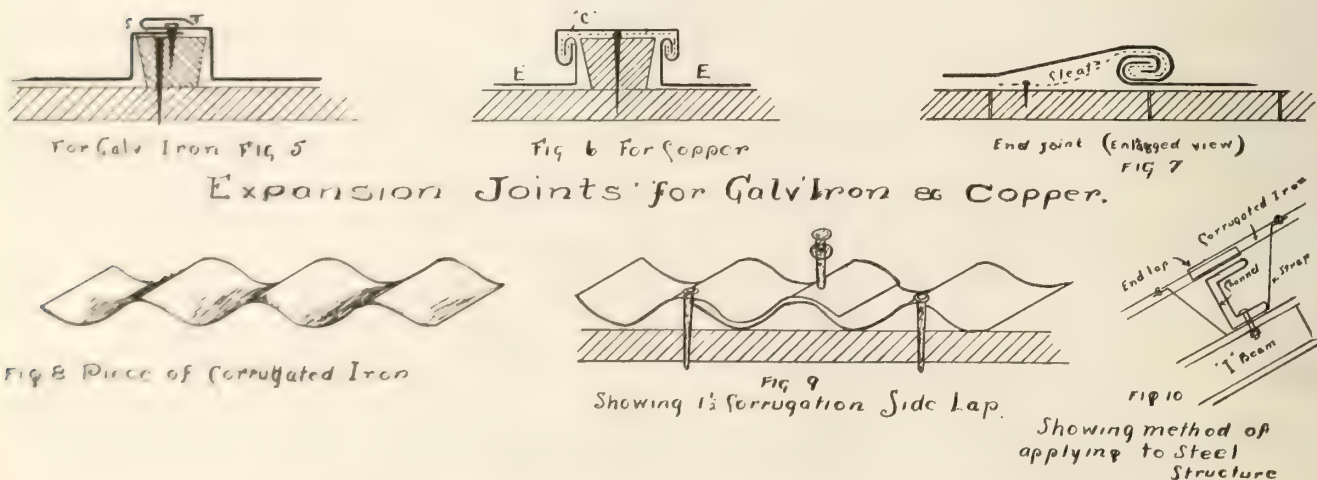
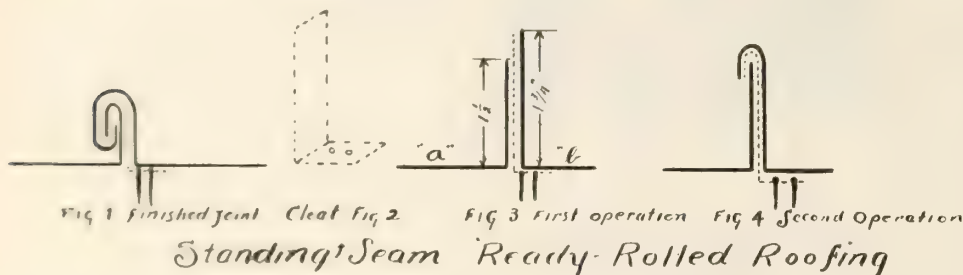
The corrugations also provide for expansion and contraction and provide raised ribs to nail through, a galvanized nail and lead washer being used.

Corrugated iron is usually made $2\frac{1}{2}$ inches from centre to centre of corrugation and $\frac{5}{8}$ -inch deep and is lapped $1\frac{1}{2}$ corrugations, as shown by Fig. 9, except where the roof is very flat or special protection is needed then it can be 2 or $2\frac{1}{2}$ corrugation side-lap.

Fig. 10 shows the method of fastening sheets to steel structure, channel irons being used instead of wood strips and the sheets fastened to these by means of metal straps rivetted to sheets and carried round the channel which in turn is usually bolted to an I-beam.

(Continued in next issue.)

38





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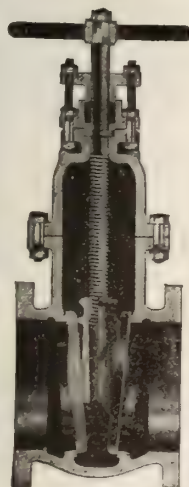


Fig. 402
(Sectional)

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Fig. 403

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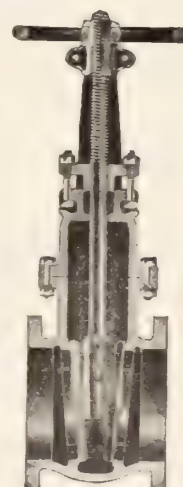


Fig. 404
(Sectional)

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PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, NOVEMBER 15, 1913

No. 21

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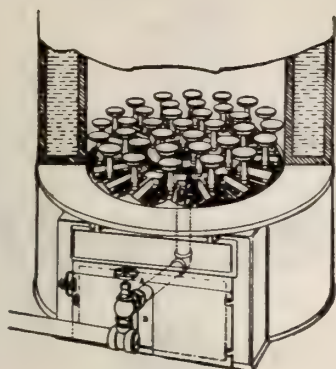
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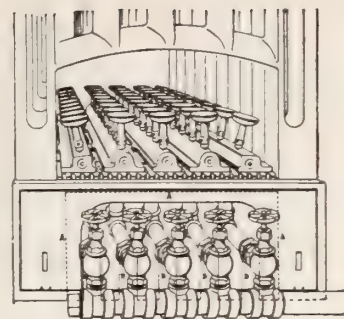
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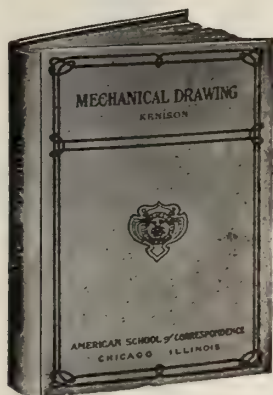
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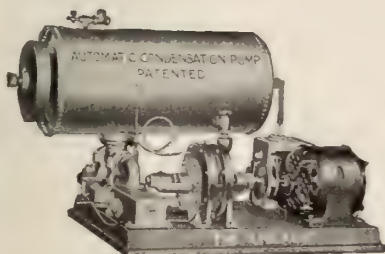
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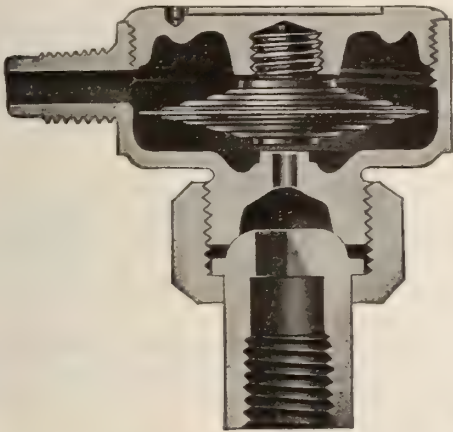
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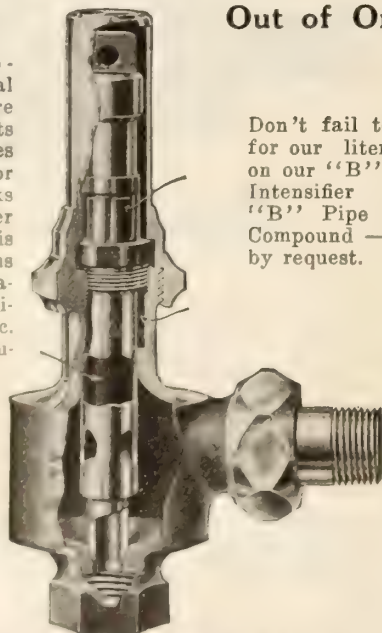
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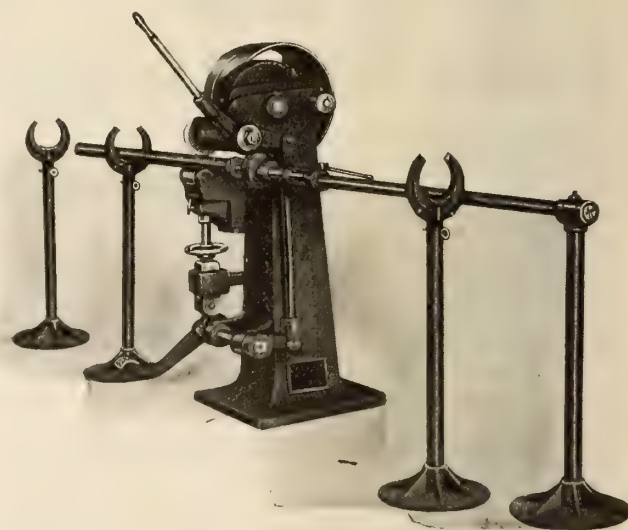
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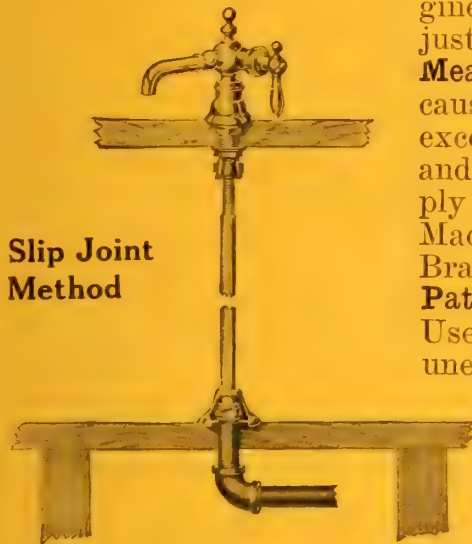
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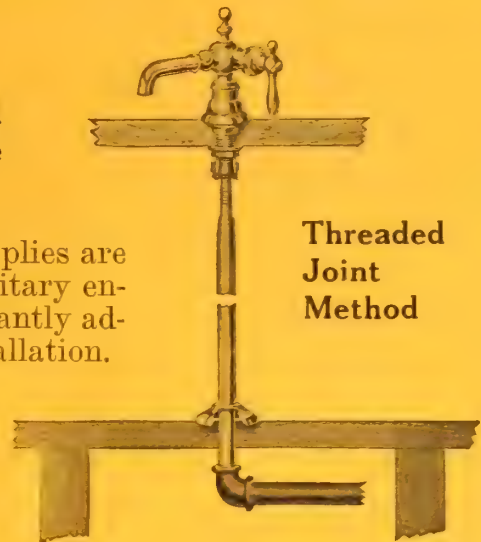
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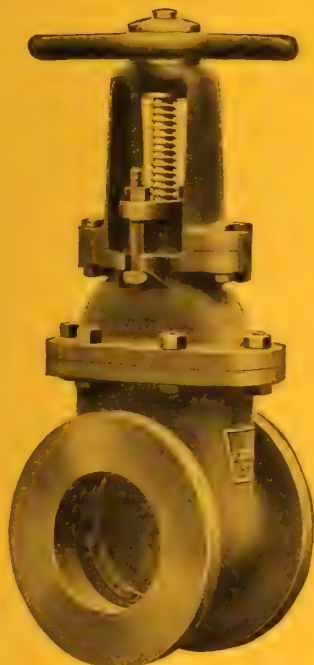
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No. 23



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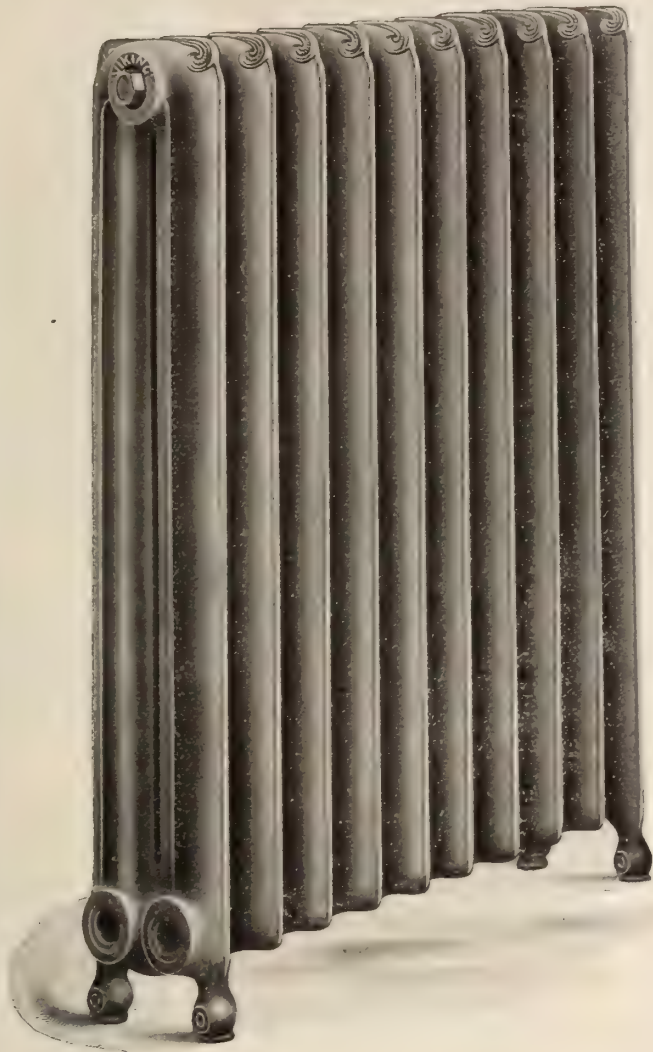
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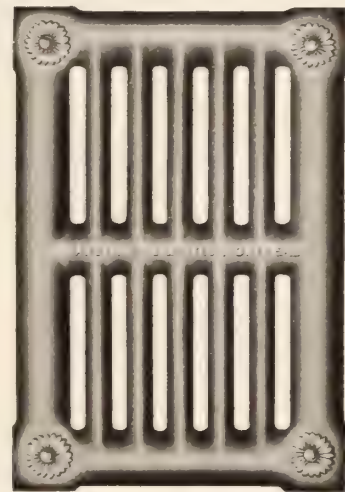


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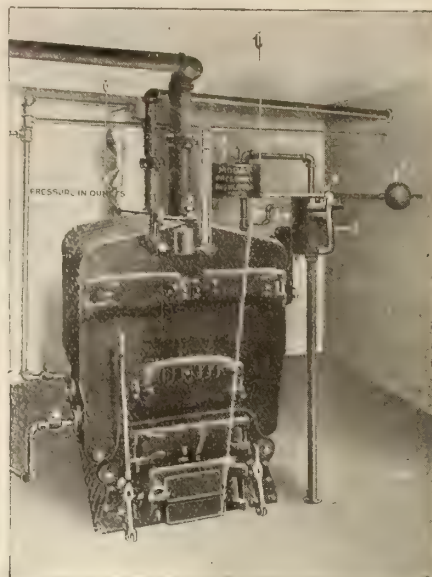
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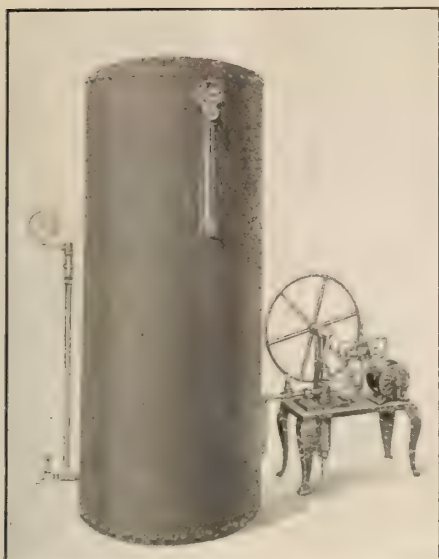
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Iron Pipe Size.

Brass and Copper Tubing.

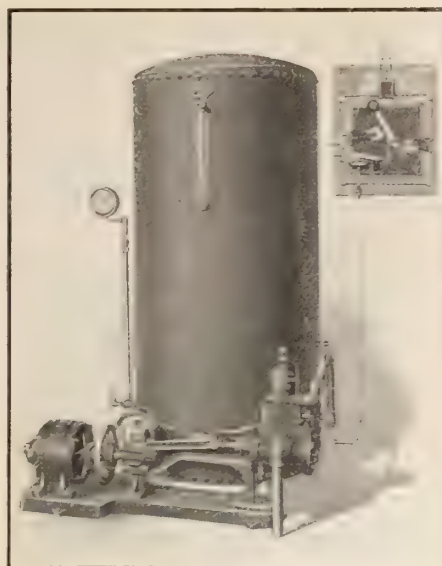
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Brass and Copper Sheet.

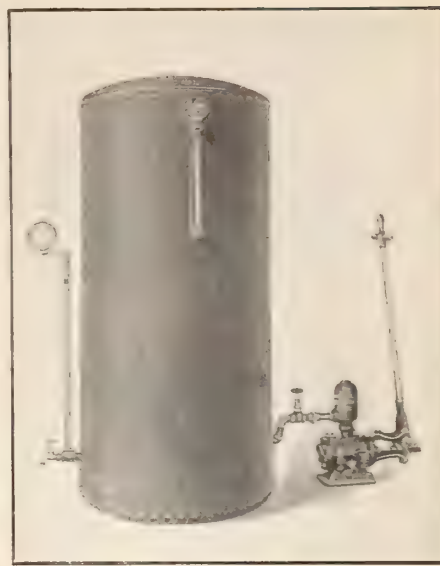
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400 Series



112-B



SIMPLICITY and EFFICIENCY



A Chat With Our Readers

There is nothing more exasperating than a water supply that "WON'T SUPPLY."

There is nothing under the sun that will turn the color on a man's hair, put the stoop in his shoulders, lines of worry on his face, cobwebs on his front show window, rust on his cash drawer as quickly as being continually in hot water over articles installed that are not proving up to the mark, or repair parts that are not satisfactory.

This being the case, you must admit that when you can get a perfect article, MADE RIGHT HERE IN CANADA, BY CANADIAN WORKMEN, BACKED BY AN IRONCLAD GUARANTEE, BY A GOOD RELIABLE CANADIAN FIRM it is not wise to take chances on a foreign made article, which when once installed MAY prove satisfactory, or MAY NOT. In either case you will have to accept the responsibility, won't you? If it goes wrong you have to be on the job to fix it up. Your firm perhaps is thousands of miles away. Repairs must come through customs which necessitates long delays. We are located right here in Toronto, you are not troubled with customs, in isolated cases where something does go wrong (which seldom occurs) we're right behind you to give you every assistance possible and back you right to the limit.

Now then—what we want you to do is this—we want you TO HANDLE, TO INSTALL, TO BOOST in every way possible a water system that is ABSOLUTELY WITHOUT A PEER IN THE WORLD. You'll be proud to sell it. You'll be proud to install it.



We are taking space every issue in this paper to tell you about these systems, about our plans for co-operation with you for future business. Watch our advertisements.



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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, DECEMBER 1, 1913

No. 22

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The MacLean Publishing Co., Limited

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SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

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Published on 1st and 15th of each month. Subscription, Canada, \$1.00; United States, \$1.50; Great Britain and the Colonies, 4s. 6d.; Elsewhere, 6s..

Cable Address: Macpubco, Toronto; Atabek, London, England

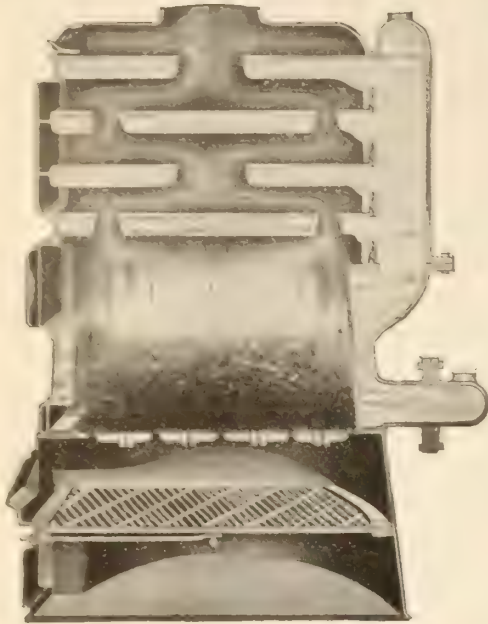
Do you know of a Sanitary and Heating Engineer anywhere in Canada who is not subscribing to *The Sanitary Engineer*? If so, you will be doing him a good turn by sending us his name and address, so that we may forward him a sample copy and order blank.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

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These and the other manifold features of the "King" Boiler are ones that make an impression on a man. A half-hour's talk on straight common-sense advantages like these will influence your prospect more than all the "oldest firm" and "longest record" pleas the other fellow can think up in a week.

King Boilers are making records and reputations for themselves and those who install them.

"King" and "Imperial" Radiators are so well and favorably known that it is only necessary to mention them.

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THE SANITARY ENGINEER

VOL. VIII.

DECEMBER 1, 1913.

No. 22

Canadian Institute of Sanitary Engineers

Their Aims and Objects Showing That Members Must be Practical Men and be in Entire Sympathy With the True Cause of Sanitation.

We had several inquiries from members of the craft asking that we give particulars of this new institute. Hence, we are here producing an exact copy of their Book of By-laws recently issued which reads as follows:

The name of this society shall be The Canadian Institute of Sanitary Engineers, and the objects for which the society is formed are:

(a) To suggest plumbing regulations which shall govern the design and installation of plumbing systems, and to encourage the adoption of such regulations.

(b) To advance the standard of plumbing and building sanitation and promote sanitary science by reading, discussing and publishing professional papers and the interchange of practical and theoretical knowledge and experience.

(c) The advocacy of a high professional standard of integrity among the inspectors of plumbing and sanitary engineers.

(d) To encourage and promote Provincial legislation requiring the appointment of inspectors of plumbing and the examination and registration of plumbers.

(e) We favor the appointment of inspectors of plumbing for a term of office dependent upon good behavior.

ARTICLE 1.

Section 1. The officers of this society shall consist of a president, four representing the various provinces' vice-presidents and a secretary, who shall perform the duties of treasurer and a board of directors to be composed of the president, secretary and three other members.

Sec. 2. No person shall be eligible to take office in this society unless he is an active member and in good standing.

Sanitary Engineer Defined.

Sec. 3. "One, who having acquired a broad knowledge of the phenomena, laws and principals of sanitary science, has, by practical experience in the art of constructing sanitary works or operating sanitary orivesses, become qualified to

design and execute important sanitary works or to materially improve sanitary methods and procedures."

The foregoing definition shall constitute a standard by which Sanitary Engineers shall be measured for eligibility to active membership in this society.

ARTICLE II.

Section 1. The annual meeting will be in a city to be determined upon at each preceding annual meeting and be held on the First Monday in May. The board of directors may, for exceptional reasons, change either date or place, or both, due notice being given each member three months in advance of the meeting. A semi-annual or special meeting may be called by the board of directors, but the date must be determined upon and the members notified sixty days before date selected for the meeting.

Quorum.

Sec. 2. Nine members present at either annual or special meeting shall constitute a quorum.

ARTICLE III.

Membership.

Section 1. The society shall be composed of members, associate members and honorary members.

Sec. 2. An applicant for membership shall be an inspector of plumbing or sanitary engineer. The board of directors, having in mind the broad purposes of the society, shall determine the qualification of applicants.

Sec. 3. Associate membership shall be extended to all those who are interested in sanitary science and the objects of this society, and shall become eligible to active membership at the end of two years, provided they make application in proper form.

Sec. 4. Recommendations of candidates for honorary membership shall be presented at the annual meetings and they must have the unanimous endorsement of the board of directors before their names are submitted to the meeting for ballot.

Amendment of Article 3.

Sec. 5. The board of directors may, at any time, by majority vote, remove for cause any officer of the society, and shall report its findings at the next annual meeting of the society.

Sec. 6. An inspector of plumbing who ceases to hold office may continue in active membership on compliance with the prescribed requirements for such members.

ARTICLE 4.

Election of Members.

Sec. 1. Every candidate for admission to the society, except candidates for honorary membership, must be proposed by at least 2 members who know the applicant either personally or by reputation. An applicant indorsed by the Mayor or chairman of the city or town council will be accepted with the personal indorsement of one member. Any applicant not residing in Canada shall be subject only to such limitations respecting indorsements as the board of directors shall determine. The application for membership must contain a statement by the applicant of his experience and qualifications for membership, including an account of his professional education or experience.

Sec. 2. All applications for membership are to be sent to the secretary and acted upon and approved by a majority vote. Such applications shall be in the hands of the board of directors at least sixty days previous to date of the next convention.

Sec. 3. Any person elected to membership in the society shall be promptly notified by the secretary and he shall pay his initiation fee and dues within two months after due notification or his election will be void.

ARTICLE 5.

Initiation Fees and Dues.

Sec. 1. Initiation fees of members shall be five dollars, payable upon notification of their election. No initiation fee will be exacted of associate or honorary members. The annual dues of members and associate members will be five

dollars, payable in January of each year in advance or not later than two months after notification of the election to membership. Members elected after July 1st, shall pay half dues for that year in which they are elected. Any associate member elected to full membership shall pay an initiation fee of five dollars.

ARTICLE 6.

Sec. 1. The president shall preside at all meetings of the society and exercise general supervision over its interests and welfare. He shall also be, by virtue of his office, chairman of the board of directors and a member of all standing committees. He shall have power to call special meetings of the board of directors, if he deems it necessary or is requested by three members of the board of directors. He shall appoint all committees not otherwise provided for by resolution or assigned at the annual meeting. He, or the first vice-president, shall, with the secretary, sign all checks, written contracts or financial obligations of the society authorized by the board of directors.

The Vice-Presidents.

Sec. 2. In the absence of the president from any meeting any vice-president, in the order of his rank, shall be vested with all the powers of the president. In the absence of the president and vice-presidents the members at a meeting shall elect a temporary presiding officer, the secretary calling for a vote.

Secretary-Treasurer.

Sec. 3. The secretary shall be present at all meetings of the society and of the board of directors and keep the minutes thereof. He shall conduct the routine correspondence, receive all communications addressed to the society and present the same to the society or to the proper committees. He shall issue notices of all meetings, promptly inform committees of their appointment and officers and new members of their election. He shall keep a complete list of members with their addresses and dates of election, and shall send a copy thereof to each member annually. He shall perform such other duties pertaining to his office as shall be imposed upon him by the board of directors. He shall, as treasurer, collect and have charge of all funds and shall deposit them to the credit of the society in such depository as may be designated by the board of directors. He shall pay all duly approved bills and shall keep accounts of all his receipts and expenditures, which shall be at all times open to the inspection of the board of directors. He shall present, at each annual meeting, a detailed written statement showing the re-

ceipts and expenditures during the previous years, which statement must be duly audited by an auditing committee, to be appointed by the board of directors at the annual meeting. He shall make a report to the board of directors as to the financial standing of the society at any time they may call for it, provided that not less than 3 days notice shall have been given. He shall give a bond for the faithful performance of his duties, in such amount and with such securities as the board of directors may require, the premium on the bond to be paid by the society.

Sec. 4. The board of directors shall consist of three members of the society, in addition to the president and secretary, making the full number five persons. They shall have the supervision and care of all property of the society, and shall manage and conduct its affairs in accordance with the constitution and by-laws. The board shall have full power between meetings. They shall hold stated meetings at the written request of two members of the board, or upon the call of the president. Three members of the board of directors shall constitute a quorum. They shall fill any vacancy occurring between meetings among the officers of the society. The board of directors shall, at the first session of the annual meeting, appoint from the active members three auditors to examine and certify the accounts of the treasurer. Any standing committee that may be approved, shall observe such rules and regulations as the board of directors shall prescribe. Any member of the board of directors who shall absent himself from three consecutive stated meetings of the board, without excuse satisfactory to the board, shall cease to be a member thereof, and the board shall proceed to fill his place for the unexpired term, due notice of which action shall be sent him.

Sec. 5. The publication committee shall receive and examine all papers for presentation to the society, and accept for publication such as it may approve. It shall publish during each year the proceedings of the society, containing the papers and discussions so approved, and abstracts of the minutes of the society and board of directors. No member shall publish any paper as having been read before the society without obtaining the consent of this committee, and such permission shall not be construed to be an indorsement by the society of any statements advanced in such papers or publication. The publication committee is to be in charge of all books, periodicals and drawings and similar property belonging to or loaned to the society.

ARTICLE 7.

Sec. 1. The election of officers of the society shall be held at the annual meet-

ing. This election shall be by roll call. In each case the candidate receiving the majority vote shall be declared elected to the office in question.

Sec. 2. A vote of members in arrears for more than one year's dues shall not be counted.

ARTICLE 8.

Resignations, Expulsions, etc.

Sec. 1. Any member whose dues shall be paid in full may resign at any time. Resignations must be presented in writing to the board of directors who shall act on them at their first meeting following their receipt.

Sec. 2. Any member whose dues shall remain unpaid for one year shall forfeit the privileges of membership, and if he neglects or refuses to pay his dues within 30 days after notification from the secretary, his name shall be stricken from the roll of members, only by unanimous vote of the board of directors.

Sec. 3. Any member may be expelled for conduct on his part likely, in the opinion of the society, to endanger its welfare, interest or character; provided, however, that charges have been made to the board of directors by a member of the society in good standing, or any person under oath, and that the board of directors have, after investigation and opportunity for defense on the part of the accused, recommended that the member be expelled.

Sec. 4. Any person ceasing to be a member of the society, through resignation or otherwise, shall forfeit all right, title and interest in the property of the society, and shall surrender his certificate of membership.

ARTICLE IX.

Society's Indorsement.

Recommendations, indorsements, or approval shall not be given to or made for any individual, firm, association or corporation, nor for any scientific, literary, mechanical or engineering productions. The opinion of the society may, however, be expressed on subjects affecting the public welfare in regard to plumbing, sanitation and engineering, provided that this opinion does not carry with it the promotion of the interest of any individual, firm, association or corporation.

ARTICLE X.

Amendments of the constitution and by-laws will be considered only at annual meetings, or must be presented in writing to the board of directors between meetings, signed by at least three members. The question of the adoption of such amendments shall be voted upon by ballot in the manner prescribed for the election of members.

Change Your Display More Frequently

Showing How Business Could be Encouraged by Making One's Store More Attractive—A Nice Card in the Window or a New Fixture With Card Attached Demonstrating its Good Points.

There has been a great deal of discussion and will be along these lines as to whether a Sanitary and Heating Engineer should or should not maintain a

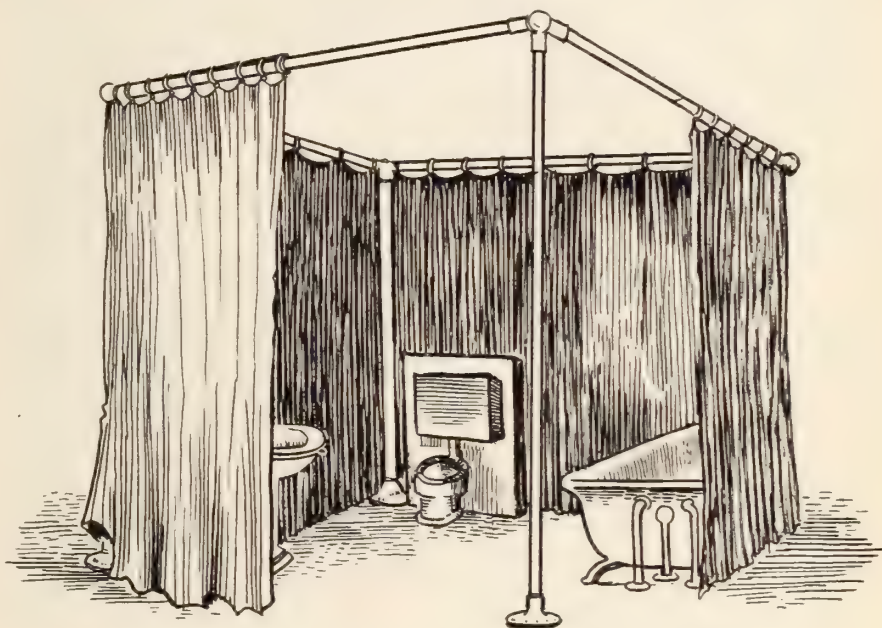
We do not propose right off to make a statement that he should maintain a store, or even that he should not. But, we must say this if a store is decided upon, then by all means make it attractive. Keep it clean not too overcrowded, and with not too many small articles on view. For instance, if a store window were to be dressed with just one or if large enough space were available, say two baths, both fitted up with the necessary fittings, then several varieties of bath fittings only, viz. different kinds of styles of water cocks and supplies with the waste and overflow to match, should be used.

Then say in a couple of days or even a week change the position of the baths and fit another style of fixtures on them, with an attractive card illustrating the different claims that can be vouched for in that fitting, etc. Then later on change your display to several style lavatories and use the same method regarding the fitting up of them.

Make a few more changes by putting a number of w.c. seats fitted with all kinds of hinges and point out the difference in quality along with the price and show where many a man can spend \$5.00 to good advantage if he spends it wisely by taking advice. You craftsmen know, or should know, a piece of brass goods when you look at it but how many really do? For instance, a valve may be nicely gotten up and to all appearances seem to be as good as one could desire, but, whose make is it? Have the firm a good reputation? What is the material composed of? Has it good wearing qualities? Does it bear the maker's name? In fact, it takes a smart sanitary and heating engineer to choose the goods he buys. The writer could show two valves even in their rough state and by appearances they would look almost identical. But stop, what use are these values going to be put to, and what price are they? Three months ago a person complained that they had just got a new hot water tap put on the sink. In a week's time it began to leak thus causing this party to use more strength than is really necessary to close the tap; the result was that the tap was wrenched off which showed a defect in the casting. This may happen in many cases but not in the best. Why? simply because the

best methods are used to mould these castings. New mixtures are made. No scrap brass is put into first-class castings. Nobody knows what compound some scrap brass is composed of. Hence, if the maker of a piece of brass goods take a pride in his products, he will take care that he knows what his products are composed of. He is the man who will take care of your quality if you will pay the price. Reverting back to this individual who was dissatisfied at a tap leaking in a short time. The writer advised him to buy a good make and mentioned several of good repute. What is the results? It is in good order yet and will be. So it is up to the sanitary and heating engineer to become

matter was as nicely laid out and installed as could be desired, but what was this exception? It was the fact that every cock, every waste fitting and pipe was cut up most abominably by the journeymen having used a Stillson wrench on them. If these journeymen or their employers knew the amount of labor that was put on this portion of the brass goods to turn them out nice and neatly finished, they would never attempt to use a Stillson wrench on such fittings. Further if the workman had any idea of the horse power which is being exerted on the threads of these fittings when using an 8 or 14 in. wrench they would be surprised. If they could see the number of beautiful fixtures



thoroughly posted on the quality of goods he buys and sells later to his customer. There are lots of manufacturers who will stand back of their goods, who, of course, are a little higher in price than others but who supply the goods which give the most satisfaction. (In our next issue we will publish an article on the evolution of a basin cock, showing the different processes which have to be taken into account when placing these on the market. It will describe the manufacture from the start to the finish in a general way.

It will also show how these should be handled by the sanitary engineer during their installation. For instance the writer had the pleasure of looking over several fine installations a few weeks ago which with the exception of one

strained and destroyed, then returned as defective, it would be a revelation to them.

Therefore, when you describe these goods in your window, or show-room point out to your customer that the goods you supply him will not be cut up with wrenches not made for that purpose but will be fitted carefully and when installed will have just as fine an appearance as they have in your store. We had a suggestion handed in to us a while ago regarding the changing of the displays which we here reproduce.

It is simple and speaks for itself and is not a very expensive proposition.

First take some $\frac{3}{8}$ or $\frac{1}{2}$ in. pipe and make a rail of a suitable height. Then drape it with a light colored curtain

(Continued on page 24.)

Sanitary Engineers Problems in Winnipeg

Dealing With the Problem of Hoar Frost at the Terminals of the Soil Pipe Stack—The Atmospheric Pressure in That City is Again Producing the Evidence of Trouble.

By James Smith, Inspector of Sanitary Engineering, Winnipeg.



JAS. SMITH,
Chief Plumbing Inspector,
Winnipeg.

Read at the annual meeting of the American Society of Plumbing Inspectors and Sanitary Engineers, held at Louisville, Kentucky.

Winnipeg, by reason of her geographical situation, has the climatic distinction of being one of the coldest

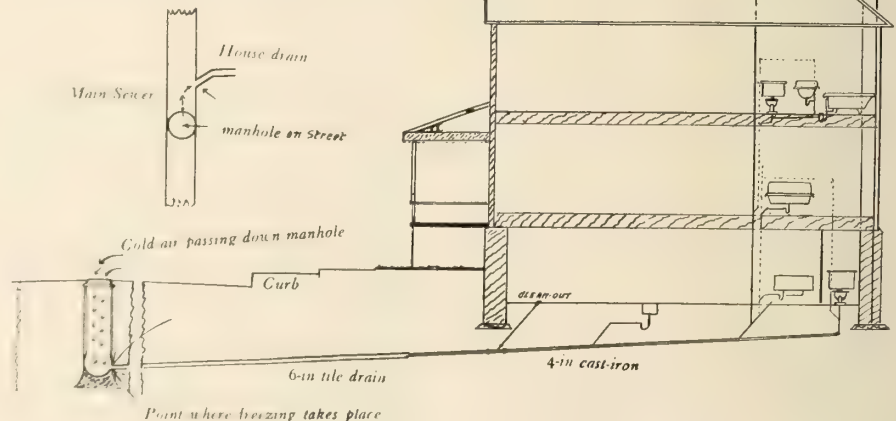
cities on the Continent from December to March, and similar conditions exist to a greater or less degree throughout the three Prairie Provinces of Manitoba, Saskatchewan and Alberta, and that portion of Ontario west of the Great Lakes. It is, therefore, necessary that unusual and what would seem to the uninitiated unnecessary precautions be taken to prevent freezing in air and gas, as well as waste and water pipes.

Few of us realize until actually in contact with experience the immense force exerted by nature in the process of converting a liquid to a solid body by freezing. One authority places this pressure at approximately 30,000 lbs. per square inch, and it is easy to assume that this calculation is nearly correct when you consider that the ratio of expansion in water at zero centigrade is 10 per cent.—that is to say, 10 cubic inches of water is expanded in freezing to 11 cubic inches of ice. Unusual difficulties are, therefore, met when making laws governing plumbing under such severe climatic conditions. No water pipes, waste or soil pipes or vent pipes are allowed to be placed in external walls of buildings, and even where it is necessary that pipes shall project above buildings, such as the terminals of soil and vent pipes, the extent to which such pipes are exposed above the roof is limited to 12 inches. In addition, all pipes are increased 2 inches before passing through the roof and protected by a double casing in the manner shown on the attached drawing A. The closing of pipe terminals at roofs is the most prolific cause of trouble in this country, and after a period of extremely cold weather it is the exception rather than the rule to find a pipe terminal without a snow cap partially or wholly closing the pipe, causing syphonage of the small fixture

traps in the building. The method shown in drawing A has not been entirely satisfactory, and we intend carrying on experiments next winter to determine whether better results cannot be obtained by increasing the pipe 2 inches and finishing it flush with the roof, with a lead flashing caulked into a hub. I may state for the benefit of those not familiar with the aforementioned conditions that the closing of pipe terminals is due to the suspended moisture in the air passing out of the pipe, being condensed and converted into snow or ice immediately on coming into contact with the cold outside air.

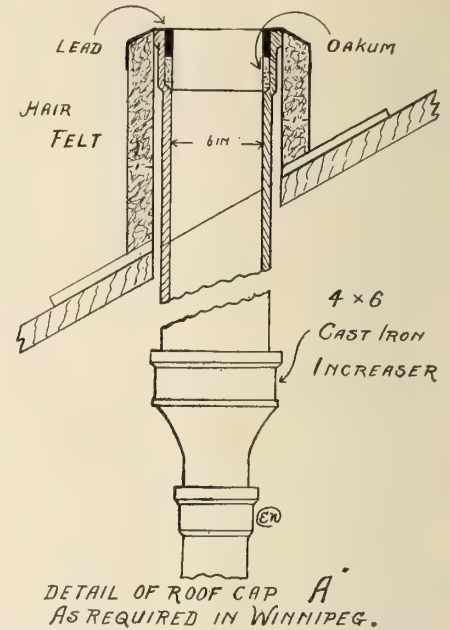
New Argument in Favor of House Traps.

For some years the insertion of the main house trap on plumbing systems in Winnipeg has been optional with the owner, and at the present time over 10,000 systems have been installed without house traps. A few months ago it was found necessary to revert to the use of the house trap again owing to the large number of main sewers and house connections freezing, resulting from the induced draft caused by the ventilating stacks through building drawing cold air (from 20 to 40 below zero Fahr.) through the manholes on street into sewer and gradually freezing the water into the sewers and connections. During the winter of 1912 and 1913, 139 house connections were reported frozen, and there were probably as many more frozen which were not reported. These connections, generally



speaking, were close to manholes, but in some instances they were 50 and 60 feet from manholes. In the same period 75 main sewers were frozen, some of them measuring 2 feet 6 inches in diameter, and ranging from 8 feet to 25 feet below the street level.

The freezing of these pipes became such a serious matter that an amendment to the plumbing by-law was passed by the City Council recently making it compulsory to instal house traps on all new plumbing systems. No instances



are on record where the house connection blocked by freezing when a house trap was used.

All sewers, drains, and water pipes outside of buildings are required to be

not less than 6 feet below ground level.

The minor troubles incident to this climate are legion, most of them can be avoided by careful construction, but there are others which no amount of foresight can obviate. This is particular (Continued on page 24.)

The Analysis of Canadian By-laws

In This Issue We Are Commenting on the By-laws in Vogue at Present in the City of Calgary, Known as By-law No. 1531, and Came Into Force on the 24th Day of February, 1913 — These Comments Will be Divided Into Several Series, of Which This is Part One.

This by-law which in Calgary is known as City of Calgary Plumbing By-law No. 1531, is about the most recent to be issued as far as we are aware with the exception of the Toronto by-law. It is crowded with novel features, at a glance one can see points embodied that are not combined in other by-laws of the same nature. For instance: Clause 2 states that an application shall be made to the Board of Examiners for an examination as to qualifications of the applicant and reads as follows:

Clause 2. Any person desiring to follow, engage in, or work at the trade or occupation of plumbing in the City of Calgary shall first make application to the Board of Examiners hereinafter provided for and shall at all time and place as such Board shall designate undergo such examination as to his qualifications and competency as the Board of Examiners may direct.

This in itself is an entirely new clause and not found in any of the by-laws already commented upon. It is a clause to be desired if put into actual practice, at some future date we promise our readers they shall know how this clause works out in the City of Calgary.

Clause 3 refers in a sense to Clause 2, and reads:

There shall be deposited with each application for a Master or Employing Plumber's Examination the sum of Five Dollars (\$5.00) and for each Journeyman Plumber's Examination the sum of One Dollar (\$1.00) as an examination fee.

Clause 3 is a good clause and one which should be embodied in every city by-law. It is one which first and foremost proves the earnestness of the applicant. It will tend to prevent any one from applying who has not a fair knowledge of the practical as well as theoretical, simply because an applicant once applying for certificate and not successfully passing would show at once his unfitness, hence would not apply until reasonably sure he could fill the requirements necessary. It would, of course, be very desirable if examination papers could first be supplied so as to enable an applicant to study and prepare for the examination before going to the Board of Examiners, and these papers are possibly to be had, but as far

as the by-law goes, no mention is made of them. The rest of the Clauses up to Clause 7, are general. But in Clause 7 we find the definition as to the features the examinations will take, and will here re-produce it:

"Said Board of Examiners shall within Thirty (30) days after appointment of said members, meet and organize by the selection of a Chairman and Secretary, and they shall designate the time and place for the examination of all applicants for licence.

Said Board shall examine the applicants as to their practical and theoretical knowledge of Plumbing, House Drainage, and Ventilation, and also as to their knowledge of the By-laws of the city regulating such work.

Such examination shall be made in whole or in part in writing.

If satisfied as to the competency of the applicant the Board shall so certify to the License Inspector for the City of Calgary and such Inspector shall thereupon issue to such applicant a license in accordance with such certificate authorizing him to follow, engage in or work at the trade or occupation of plumbing, either as Master or Employing Plumber or as a Journeyman Plumber of the City of Calgary.

The fee for the license of a Master or employing plumber shall be Twenty Dollars (\$20.00) for a Journeyman Plumber, it shall be Two Dollars (\$2.00; said license shall be renewed annually upon payment of Five Dollars (\$5.00); for the Master or Employing Plumber; and One Dollar (\$1.00) for the Journeyman Plumber.

This clause which speaks for itself does not define what date this license expires as is the case with several other cities in Canada.

In Ottawa, for instance, all licenses expire on the 31st of December and must be renewed January 1st the following year irrespective of the date when the first license was granted. Hence, if a person made an application during the year other than January 1st his license would expire on January 1st even if it had only been in vogue a month.

It would be a very commendable idea if carried out to reduce the amount ac-

cording to the portion of the year expired and still have all expire on Dec. 31st, as this clause 7 reads these licenses expire annually which would date from the time they are granted.

Clause 8 speaks for itself and states that although a master plumber employing journeymen has a master plumbers' license he is required to take out a journeyman's license too if he should actually work in the trade with his tools. We do not see any reason for such being required unless the examinations are not so practical for the master as the Journeyman.

Clause 10 reads as follows and is a very commendable one:

The license herein provided for of any master or journeyman plumber may at any time be revoked for incompetency, or dereliction of duty or fraudulent use thereof, after a full and fair hearing by a majority of the Examining Board, but an appeal may be made from said Examining Board to the Board of Health whose decision shall be final.

This clause not only guards the public but it also causes the mechanic to take more interest in his work, hence creating a higher efficiency in the craft, no man knowing that by carelessness, or shall we say disinterestedness, he is liable to forfeit his license, will persist in doing poor work, but will rather strive to attain a higher standing with the craft. This is desirable as we know of lots of work that while being able to stand the different tests, are anything but good workmanship. From Clause 10 to 15 inclusive are general.

Clause 16 is next to be taken up which we here reprint:

Each application shall state the proposed plumbing work to be done, and give the sizes of all pipes, the location and kind of traps and fittings together with a description of all closets and other fittings to be connected.

All plans shall be legibly drawn on heavy white paper or tracing linen, and on a scale of not less than eight feet to one inch, and shall be annexed to the application. A blue print will be accepted.

Such scale drawings shall consist of such floor plans and sections as may be necessary to show clearly all

(Continued on page 21.)

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year, United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS: Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - President

J. G. Lorrimer, - - - Manager

Edwin Newsome, - - - Editor

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, DECEMBER 1, 1913

Sanitary Engineers Advocate Efficient Plumbing Inspectors

Showing Why Canadian Cities Should Have Efficient Inspectors—Men Who Have Served Years at the Calling and by Actual Experience Have Acquired a Thorough Knowledge of the Trade.

In another article entitled "Sanitary Engineering in Our Public Schools," we are producing some plans of piping which modern sanitary fixtures have been connected with.

These plans speak for themselves to the well-versed mechanic. As stated in our last issue it brings back the ever-present question, "Efficiency of our plumbing inspectors."

Now this is a public matter. It is a feature which should be taken up at every association; it is of vital importance, and the more we think of it the more we are convinced that the subject should be aired through the public press. Sanitary engineers should be more public spirited. They should join hands in the welfare of the citizens at large. They should voice these matters which are under their notice more publicly. They should boost true sanitation and show the public openly and above-board that their (the citizens') welfare is at stake.

Demand Efficiency.

In many a score towns there are men holding the position of plumbing inspector who never worked a day at the trade, who do not even know the size a pipe is called; for instance, the writer can cite one inspector who came to him and asked which was the proper way to measure a pipe, inside or outside. Of course he was told. Now what is going to be the result? The public are being squealed into employing men to superintend work and pay for work that is not being properly executed. This is an ever-present cry. The public at large are ever complaining at the prices charged, yet they are the ones who encourage this class of work.

The sanitary engineers who have any conscience at all are and have been agitating as best they could the necessity for higher efficiency. They want first class men to inspect the work done for the public. If this was accomplished, and every town and city were forced by law to employ an expert, a man who had the necessary knowledge and practical ability to scrutinize the work done, then and then only would the public receive full protection.

Cut Out Cheap Jacks.

Such a course would prevent all that great army of tinkers, which the country is full of from practicing on the trade and putting up inferior work and charging a high price for. Of course the public are always on the lookout for something lower in price. They are always ready to take advantage of a "bargain" sale. If they could be made to feel that whatever loss of profit is incurred at a bargain sale, is made up on the days of regular sales they would benefit by such knowledge. It is the same when the town council of a town or city employs any cheap Jack to take a position as inspector of plumbing or sanitary engineering.

Guard Their Own Interests.

We have on file correspondence from all over this fair Dominion where men are engaged to inspect such work, and are allowing work to be done by inferior workmen in a poor way, and are paying a high price for it. If such work is done the result is bound to bring disaster in its train both mental, moral, physical and financial. What is required is efficiency.

The public not knowing the difference between a good installation and a poor one until it has been in use some time, should have their interest guarded. This will need to be paid for. There is nothing under the sun which costs more at the start than creating efficiency; it is the actual results of having been up against it.

But what brings such compounded results? Nothing. Efficiency is what all business men are looking for; millions of dollars are being spent along those lines and always will be. Therefore it behoves the public to see that men who know the principles of sanitation, men who have acquired their knowledge by practical experience are employed to fill such positions. In that way it would be more pleasant for all concerned. Of course such men demand a much higher salary than most civic employees. They are men who demand the highest salary of any other craftsman on the average, but who can blame them?

These men would save the general public thousands

of dollars and at the same time safeguard their lives and health as well as their pockets.

Should Be Public Spirited.

These men should not only be good and efficient craftsmen, but they should be public spirited and have the cause of sanitation at heart. They should be chosen because of their fitness from many standpoints. They should be men who could not be bought over by unscrupulous tradesmen who do not know the work properly and cannot instal work in a proper manner. We know of instances of this kind where pressure has been brought to bear upon this person acting as inspector to pass work which was not A.I. All such methods should not be countenanced for one moment. Hence it would be necessary to not only get a good man but to pay him well.



EDITORIAL COMMENTS.

Cornelius Vanderbilt began life on a farm.

* * *

Cyrus Field began life as a clerk in a New England store.

* * *

Andrew Carnegie did his first work in a Pittsburg telegraph office at \$3.00 a week.

* * *

Whitelaw Reid did work as a correspondent of a Cincinnati newspaper at \$5.00 a week.

* * *

LEAKING TRUTH.

The Ottawa Citizen of Nov. 17th has announced the fact that Sanitary Engineer has been guilty of "Leaking Truth," and writes as follows:—

"In the Sanitary Engineer of last week was a leading article on the federal department of health in which appears the statements that 2,000 people died as the result of the Ottawa epidemics, and that the latter were due to the fact of river pollution.

"The practical man in charge of that publication will

have to examine the supply pipes of his information. They are leaking truth somewhere."

While Sanitary Engineer exists, it aspires to not only "leak truth," but to pour it out pure and unadulterated. It, however, is only human, and in this particular case is pleased it erred and that such a number of lives were not lost.

It must plead guilty to not thoroughly investigating and ascertaining the reliability of its supply pipes of information which in this instance was taken from an Ottawa despatch and appeared in one of our daily papers.

DON'T BE DISCOURAGED.

The other day one of our craftsmen began to bemoan the lot of the plumbers. He said the public were to blame for most of the trouble because they knew so little about the trade. They kicked at the bill, they kicked at the job, they take the whole bunch of us to be a joke. Now this, to say the least, is very regrettable though to a certain extent is really true. It is a poor impression to get of one's self. What we need to do is to wake up, become alive to the fact that old-time plumbers are now by virtue of the change which the laws of sanitation demand, sanitary engineers; the old-time plumber has gradually evolved from being a mere tradesman and mechanic to being an actual professional. So cheer up, brother craftsman, there is still a chance if you keep ahead with the times.

One or two newspapers have been airing the impression that it was no wonder the plumbers were becoming millionaires; the prices they charge are enormous, they say.

If these newspaper editors who make such statements would look up Duns and Bradstreet, they will find that sanitary engineers, plumbers and steamfitters are the lowest rated of any other body of men doing business and no craft can claim to be as necessary to civilization as the sanitary engineer.

We venture to state that to our knowledge there is not one single (or even married) millionaire plumber or sanitary engineer in the whole of the Dominion of Canada.

A Voice From Vancouver, B.C.

Sanitary Engineers Trying to Procure Provincial Enactment to Enforce the Necessity of Licensed Journeymen Only Being Permitted to Instal Domestic Sanitary Engineering.

Vancouver, B.C.—A movement is on foot among the plumbing firms to secure a provincial enactment to have plumbers licensed. Once upon a time plumbing examinations used to be held by the city, but these were discontinued some years ago. Dr. Underhill, the city medical officer, is in favor of the suggestion made, and it receives support also from all the big dealers, such as Barr & Anderson for example, who have kept open shop.

Conditions during the last eight months have not been as good as during the last four or five years. This has created a condition that has worked to the disadvantage of and even loss to the

trade. Inexperienced men have started in business in the outskirts of the city, and have gone broke after securing as much credit as possible. They would cut into prices, but cleared all right since they did not pay for their supplies.

The principle proposed is to have plumbers pass an examination. If a man, who has no certificate, opens a plumbing store he must have a properly certificated foreman. If a law with a basic principle such as this is in effect, it is felt that incompetent plumbers will be eliminated, and that it will result also in better work for the public.

Hon. W. J. Bowser, Attorney General, was approached on this matter some

time ago, but he thought the idea was to cinch a plumbers' combine. Now, however, it is thought he is more favorably inclined.

Such a law obtains in Washington State, and has worked out satisfactorily in Seattle. In one instance, however, it is stated, an old-time plumber who made a success of his business was unable to pass the examination. He appealed, pointing to his work as evidence of his ability. He won out, since he was able to prove to the judges that while he might not have been able to put into writing just what should have been done in instances, he knew exactly the best way to practically carry out the work.

R. B. B.

The Location of Refrigerator Waste

This Subject Has Been Discussed Over and Over Again—Several in the Craft not Satisfied With the Method at Present Adopted.

The subject of refrigerator waste pipes, and the proper method to adopt when sanitary engineering is being installed is, according to several in the craft not quite satisfactory, for instance, here are a few arguments. In quite a large number of working men's homes the refrigerator is placed in the summer kitchen and requires draining. The annoyance of the catch basin or tin pan is too apparent to be commented upon. Hence this trap which most by-laws call for, is left to freeze up during the winter. Then there is the fairly good-sized residence where no ice is used, but where the refrigerator still remains in the same apartment as when ice is in use. No moisture is supplied to the trap in this case and a foul odor is to be found. Then again we are confronted with another trouble in the shape of the cellar drain trap. This trap is oftener fouled by having no water passing into it than not. The writer has found scores as dry as a bone the best part of the summer. Very few residents are informed of the fact that there should be water poured into them either by flushing the floors of the cellar or some other source.

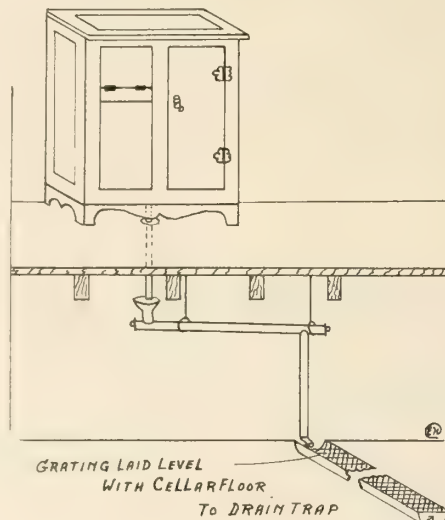
Kill Two Birds With One Stone.

Here is what could be done, and would be a sanitary job as well. The refrigerator should have merely a 2-in stretch of good strong conductor pipe fitted up to drain into a gutter which should be placed in the concrete of the cellar floor as per sketch. The waste water from the ice would supply seal for the cellar drain trap.

Then when the ice season is over these pipes could be taken down and cleaned ready for next season, the fact that so little is to be done in the cellar during summer time causes the cellar drain trap to be neglected. But when the winter time comes round the furnace has to be attended to, where hot air furnaces are used water has to be supplied for the evaporating pan, thus it is an easy matter to see that water is poured into the trap mentioned, thus preserving the seal. Many a trip is made by the sanitary engineer or his employer to a customer who has experienced the odor coming from a sewer which had this trap-seal broken. The best course for the sanitary engineer is to create a friendship between himself and his patrons by giving little bits of advice on such small matters. The public really need a little more common education along those lines, and many a customer can be re-

tained if the sanitary and heating engineer would advise in that way a simple way out of the difficulties which from time to time the householder is confronted with. We have been, as it were, too "stand offish" in our relationship towards our customers, hence we enjoy the by-word which is not really our due. Of course there is reason in all things and while we are suggesting such a course we do not wish the craft to actually give away their bread and butter.

For instance there is this suggestion as to how to keep enough water in the cellar drain trap. How to keep the kit-



chen trap clean. How to attend to a furnace and clean it. Some time ago the writer was asked how it was that furnace pipes rotted away so much during the summer, although not in use. This person had a rather damp cellar and the pipes lasted one season, and had to be renewed each fall. Well, first of all, he was buying pipes made of 28 gauge galvanized iron, he knew no better, then he was leaving them up all summer, and we know the results. He was advised to buy a good pipe of 24 gauge at least, take them down and clean them in spring, clean his furnace, etc., etc. Such a course meant, that he followed it out and recently stated that his pipes had been in use two winters and were going up a third. Such a sentiment towards our customers would do no harm, but rather good, and e'er long the sanitary and heating engineer would begin to be looked upon as more of a benefactor than he is at present. He has actually been such for many a year, therefore, by proper treatment would get the credit which is his due.

Vancouver, B.C.—It is a time-worn joke that plumbers are heavy on the charges, and an instance related by a Vancouver dealer shows how careful men must be not to cause dissatisfaction. A call came in for a man to go and fix a lead pipe in connection with a closet tank that had sprung a leak. When he got to the job, he undertook to overhaul the tank, though there had been no complaint about that, and after two hours' work had not touched the pipe. It was closing time in the afternoon, and the closet had to remain inoperative for the night. Ordinarily it might not have been noticed, but with a family of children it was different. When the bill came in, naturally there was a big kick, since no instructions had been issued about the tank.

The dealer pointed out that the proper course for the man to have taken was to have at once fixed the lead pipe, a job of less than half an hour. Then, if he thought advisable, he might have gone on with the overhauling. Had that been done, the charge might never have been questioned, since the closet would have been in use, and the family would not have been inconvenienced.

Even at that, the attention of the master or mistress of the household should have been first drawn to the tank, and permission obtained to enlarge on the original order. It would have been an easy matter to have done this, then when the bill came in there would have been no dissatisfaction, and objection could not have been raised on the ground that the man should not have bothered about the tank, since no instructions were issued in regard to it.

It is just by the use of a little judgment that customers are held and kept satisfied. As it was, the antagonism of one was aroused, while if the man had gone about the thing in the right way he would probably have got a good word both for himself and his employer, for the customer would have appreciated the man's calling his attention to the fact that the tank needed fixing, and that a leak stopped in time would save a ceiling below from being damaged. R. B. B.

BROCKVILLE CONTRACTOR DEAD.

Brockville.—John Flanigan, a retired contractor and a resident of Brockville for nearly sixty years, died recently, at the age of 77. He built the sewer system of Brockville and had other important contracts. Mr. Flanigan was a native of Castleton, Ireland. Three children survive him.

Sketches From an Inspector's Note Book

A Series of the Articles Will Appear in Sanitary Engineer From Time to Time—They Have Been Submitted by Men Who Are Holding Position of Inspectors—The Subject Will be Treated Editorially.

From time to time we have heard of freak installations being put up by men who, in many cases, had learned the way to wipe a good joint, run a soil pipe stack up, and make fairly good joints,

These sketches are actually taken from the leaves of an inspector's note book and sent to us with a view of advancing the cause of true sanitation.

This man says in part, that he would encourage more study along lines such as would convince those men in the craft that such is not only poor cheap work, but is also dangerous. He states that while he has met men who have been in the trade all their lives and who have studied the trade thoroughly, men who can install work in the most approved manner, yet if called upon to pass some examination could not even sign their own name.

Theory Not Sufficient.

Then on the other hand there are men we are told who have done a great deal

men who have no theory. In figure 2 we have a trap connect up the reverse way, had the man who installed this trap done a little theorizing he would have placed the trap the proper way. This job we understand was fairly good workmanship, and a little theory would have made all the difference in the world.

No Trap on Bath Waste.

Here is another instance where practice had its play without theory. No man who understood his job would ever be guilty of putting such a job in. There is not the slightest justification, such a job even with a trap inserted would have been dangerous unless well vented and even then should not be allowed. The bath waste should not be inserted in the w.c. bend.

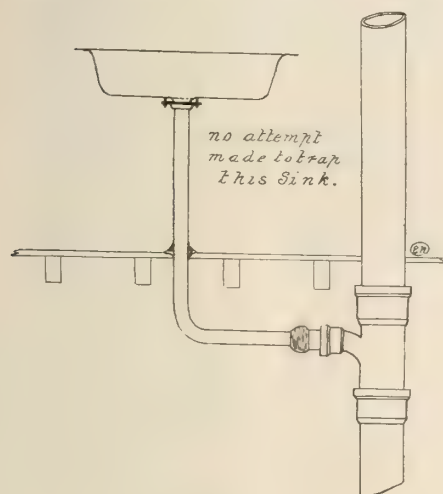


Fig 1.

but have been satisfied to let their accomplishments end at that. Now, such should not be the case. For instance, if these men would first of all become better versed in the laws of physics and gravitation, etc.; if they would view this calling they have adopted as more of a professional calling, a calling which has grave responsibilities attached to it, they would take a different course than they are doing.

Note Fig. 1.

Some of our readers will scarcely be

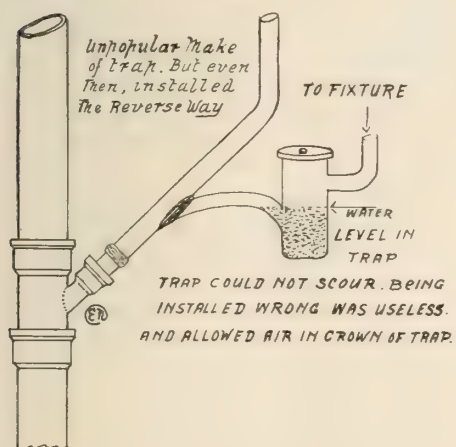


Fig 2.

able to realize that men engaged in the calling of plumbers or sanitary engineers would ever install a sink in such a way but, it is a fact we have the proofs.

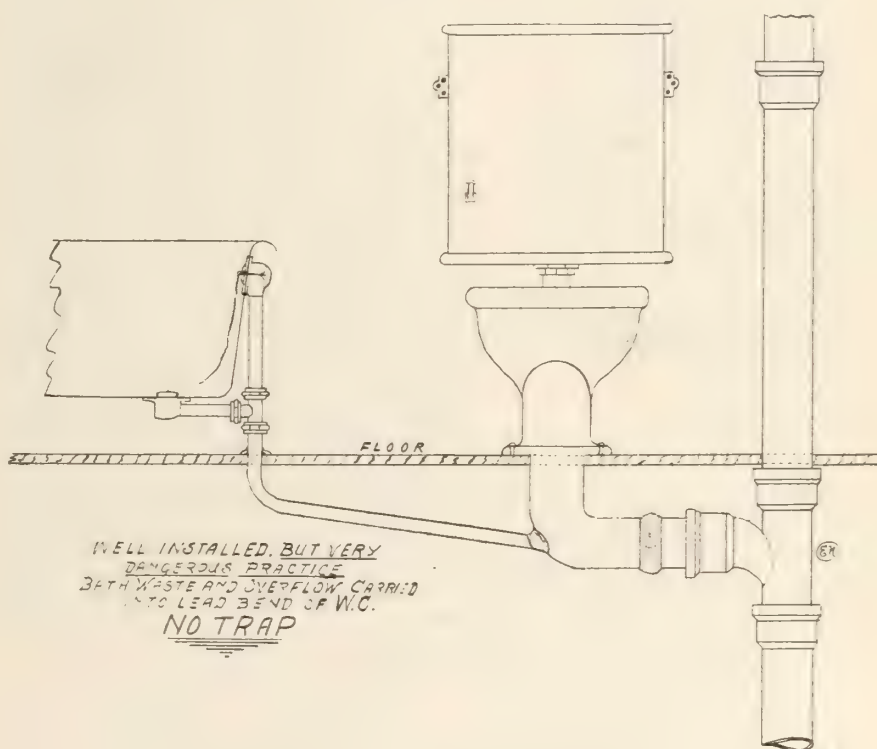


Fig 3. No Trap on Bath Waste.

of theorizing, but have never put it into practice. This is to be regretted, and while we should encourage an apprentice to get all the theory he can, he should be shown how to put such theory into actual practice. Theory is like a man having the meat but not knowing how to cook it.

Examine Fig. 2.

Then again we have the good practical

Sanitary Engineer will hail with joy when it sees more uniform laws, when the practice of inserting the bath and basin wastes into the lead bend of a w.c. will cease. It must be stated that in many towns and cities such is not allowed, but there are some who do allow it. Our next issue will contain a few more plans of freak installations under same title.

Plans of Work Recently Installed in a Canadian Public School

This Article Treats With the Subject of What is Being Allowed by Way of Poor and Non-Mechanical as Well as Unsanitary Installations in Cities and Towns Where Unqualified Men Are Employed as Plumbing Inspectors.

Much has been said about this vexed question of placing men in the position of plumbing inspectors to inspect and examine work which, as a matter of fact, they know nothing about.

First, it is surprising how men will even assume such a responsibility when

most every kind of fellow taking the job of inspector of plumbing. This is being done right under the very eyes of council men who are elected to safeguard the interest of the public at large.

A Matter of Economy.

This is done with a view of economy. These men who take these positions are generally men who never made a success at their own calling, and have been appointed in most cases as a favor or graft. We have had brought to our attention a case where good plans and specifications were drawn up by a man who had a fair experience in sanitary engineering, and who had consulted men in the trade so as to be reassured that the specifications were right. Then when the plans were submitted and tenders were called some cheap Jack was given the job; one who had some pull with one of these inexperienced inspectors of plumbing, and what are the results? Here they are:

In this installation, which has been placed in a public school, no less than 15 water closets, 18 lavatories and 9 urinals, all on one 4-inch cast iron drain, and not one fixture vented. We have produced plans. Let our readers look at the plan shown, Fig. 1, and note the length from the fitting in the drain to the base of the w.c. bowl. The first on the left is 3 ft. 4 in., the next 3 ft., and so on. Then beyond this drain the lavatories are connected, 18 of them. In Fig. 2 we show the method adopted. These are supposed to be vented. Well, can any of our readers imagine a better system to encourage syphonic action rather than prevent it. Just examine the fittings, then the distance from the horizontal portion from the trap to the second

openly revolt and raise public sentiment by making known to them what is being done. Our children are spending a large amount of their time in these institutions, and the very best should be put in. The most sanitary system it is possible to procure should be got, and then a

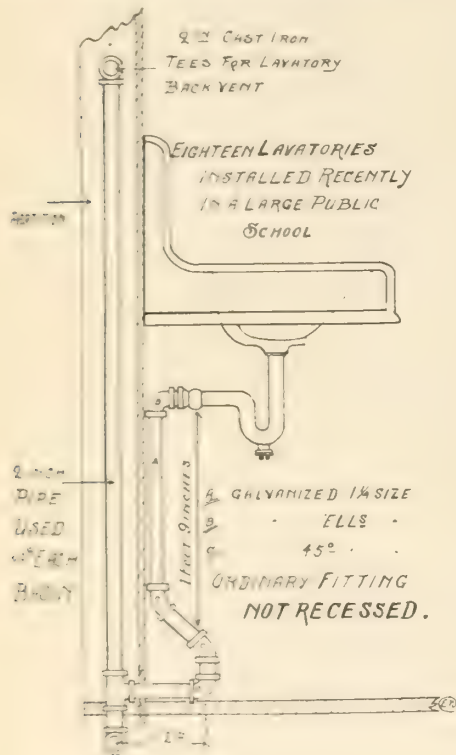


Fig. 2.

they know full well they are not capable of inspecting such work intelligently.

If a man who had no experience in the plastering trade was sent to examine some job of plastering he would demur somewhat and frankly state he knew no-

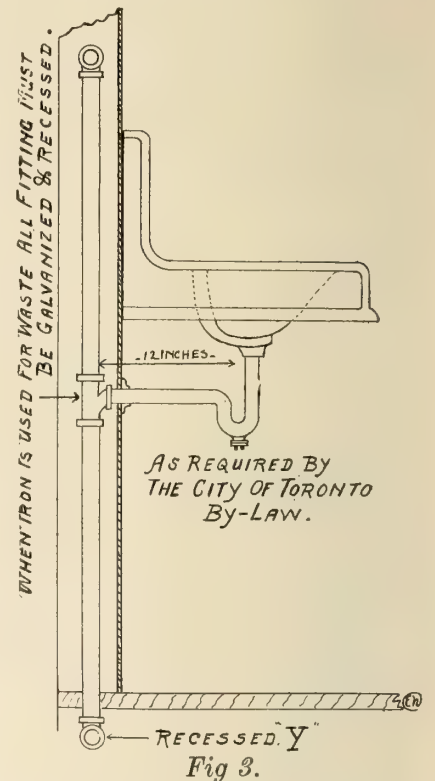


Fig. 3.

thoroughly competent man placed in the position of inspector to see that the work is done properly, and by proper qualified men. If our readers will look at Fig. 3 they will see the difference between the two methods. Fig. 2 is a joke,

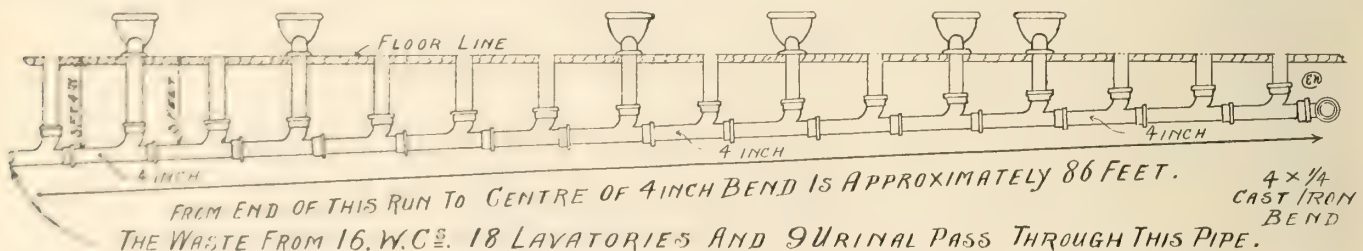


Fig. 1. No back vents on these. Note the distance from floor to centre of 4 inch cast iron drain.

thing about plastering. The same with several other lines. All of which are only of minor importance when comparing them with sanitary engineering. Yet here we have shoemakers, carpenters, plasterers, tinsmiths, shop clerks, and al-

angle elbow. Then the method of connecting at the base; it is scandalous, and it is dangerous, and in a public school. It is also more expensive. There is only one course to pursue where such rank work is being carried on, and that is to

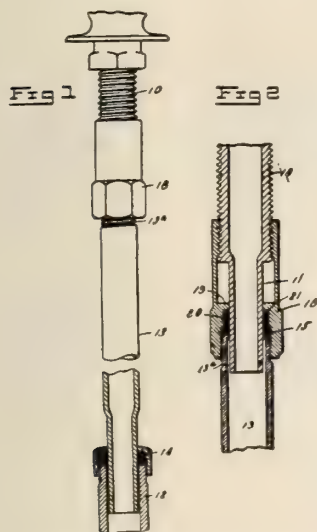
and only goes to show what can be palmed off when inexperienced men are placed in such responsible positions.

However, let us hope the day is not far distant when changes will take a
(Continued on page 23.)

New Canadian Patents

The H. Mueller Manufacturing Company, assignee of Philip Muelley and Anton C. Schuermann, all of Decatur, Illinois, U.S.A., 25th March, 1913; 6 years. Filed 2nd December, 1912. Receipt No. 217,547.

Claim—1. In combination, a faucet shank being exteriorly threaded and having an elongated and reduced extension provided with a smooth outer surface, a supply pipe engaging loosely over the reduced extension and having an inturned flange fitting snugly against the extension and further having exterior screw threads, a coupling member engaging at its ends in threaded relation



No. 146,788. Pipe Coupling.

over the faucet shank and the supply pipe respectively and having an inwardly extending flange midway of its ends snugly fitting about the extension, said flange on the coupling member providing a face in opposition to the face of the flange on the supply pipe, a gasket carried about the extension between said flanges, and a washer interposed between the gasket and the flange of the coupling member, and having a reduced extension engaging through the flange and into the supply pipe.

William Marsh Butler, Syracuse, New York, U.S.A., 18th March, 1913; 6 years. Filed 29th October, 1912. Receipt No. 216,124.

Claim.—1. A sectional boiler comprising hollow and sections and hollow intermediate sections arranged side-by-side, the front sides of the intermediate sections inclining upwardly and for-

wardly from the rear sides and provided with fire passages there through from front to rear, said intermediate sections having registering transverse openings having registering transverse openings forming an auxiliary combustion chamber between the front and rear sides thereof and communicating with said passages.

2. An upright boiler section having a rear upright water leg and a hollow water front inclining upwardly and forwardly from the base of the rear leg and portions thereof spaced apart therefrom to form an intervening combustion chamber, said inclined water front communicating with the rear water leg above and below the combustion chamber and provided with a fire passage therethrough from front to rear.

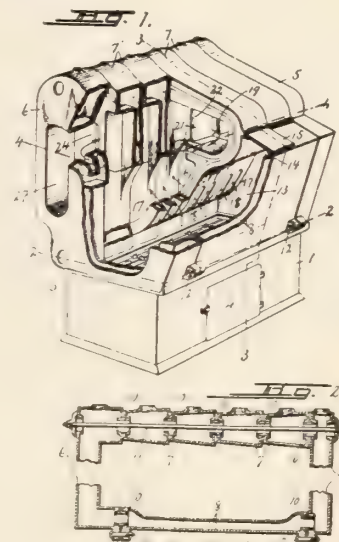
3. An upright boiler section having a rear upright water leg and a hollow water front inclining upwardly and forwardly from the base of the rear leg and portions thereof spaced apart therefrom to form an intervening combustion chamber, said inclined water front communicating with the rear water leg above and below the combustion chamber and provided with a fire passage therethrough from front to rear, the rear water leg being provided with a transverse fire passage therethrough from side to side.

4. An upright boiler section having a rear upright water leg and a hollow water front inclining upwardly and forwardly from the base of the rear leg and portions thereof spaced apart therefrom to form an intervening combustion chamber, said inclined water front communicating with the rear water leg above and below the combustion chamber and provided with a fire passage therethrough from front to rear, the portion of the hollow section in front of the water leg and above the combustion chamber being provided with a transverse fire passage communicating with said combustion chamber.

5. In an upright sectional boiler, a hollow intermediate section having a rear upright water leg and a hollow water front inclining upwardly and forwardly from the base of the water leg and having portions thereof spaced apart from said water leg to form an intervening combustion chamber and provided with a plurality of fire passages therethrough from front to rear, forming a series of comparatively shallow waterways at the sides of the fire passages.

6. In an upright sectional boiler, a hollow intermediate section having a

rear upright water leg and a hollow water front inclining upwardly and forwardly from the base of the water leg and having portions thereof spaced apart from said water leg to form an intervening combustion chamber and provided with a plurality of fire passages therethrough from front to rear forming a series of comparatively shallow waterways at the sides of the fire passages, the upper front portion of the section above the combustion chamber being provided with a transverse fire passage therethrough from side to side communicating with said combustion chamber.



No. 146,673.

Sectional Boiler.

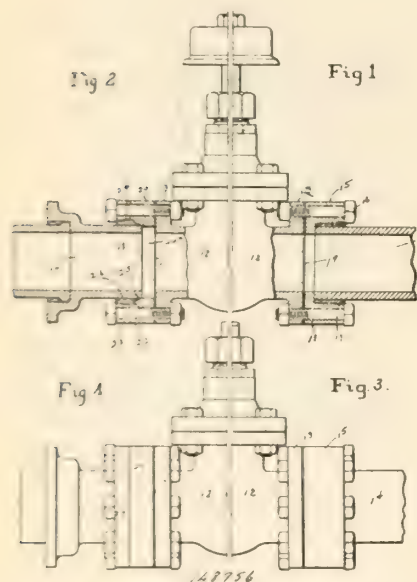
7. A boiler, comprising a fire box, hollow upright end and intermediate sections mounted on the fire box, the intermediate sections having rear upright water legs and hollow water fronts inclining upwardly and forwardly from the base of the water legs over the fire box, portions of said water fronts being spaced apart from the water legs to form an intervening combustion chamber and having fire passages therethrough from front to rear.

8. A boiler, comprising a fire box, hollow upright end and intermediate sections mounted on the fire box, the intermediate sections having rear upright water legs and hollow water fronts inclining upwardly and forwardly from the base of the water legs over the fire box, portions of said water fronts being spaced apart from the water legs to form an intervening combustion chamber and having fire passages there-

through from front to rear, the upper front portions of said intermediate sections being provided with registering horizontal fire lines communicating with said combustion chamber, said upright water legs being provided with registering horizontal fire passages communicating at one end only with the corresponding end of said fire flues.

The H. Mueller Manufacturing Company, assignee of Philip Mueller, both of Decatur, Illinois, and of John P. Mern, Brooklyn, New York, all in the U.S.A., 1st July, 1913; 6 years. Filed 18th February, 1913. Receipt No. 220,692.

Claim.—1. In combination with an interrupted line of pipe, and an insertible member adapted for positioning between the adjacent ends of the interrupted line of pipe, coupling members joining the ends of the pipe, and means engaging the of said pipe and having annular recesses



No. 148,956. Pipe Joint.

therein about the ends of the pipe, a filling poured into the recesses and a lapped to seal the coupling members upon the ends of the pipe, and means engaging the insertible member and said coupling members for securing the insertible member between the innermost ends of the coupling members, one of said coupling members being in sections adapted to be separated to expose said filling after the same is set upon the pipe.

2. In combination with an interrupted line of pipe, and an insertible member adapted for positioning between the adjacent ends of the interrupted line of pipe, a coupling member engaging about one of the pipe ends and being spaced about the pipe to provide an annular recess about the same, a filling poured into said recess adapted to seal said coupling member upon the pipe end, and

a second coupling member composed of complementary sections having oppositely inclined inner walls and being spaced about the opposite pipe end, a second filling poured into the space between said coupling sections and the opposite pipe end to seal said sections to the pipe end, and securing means engaging through said first coupling, and through both sections of the second coupling adapted for engagement with said insertible member to hold the same in place, the sections of said sectional coupling being adapted to be spread apart to expose the filling about said opposite pipe end whereby the filling may be easily removed from the pipe.

3. In combination with the spaced ends of a pipe line, and an insertible element adapted for securement between said ends, of a pipe line, and an insertible element adapted for securement between said ends, of a pair of coupling members carried upon the opposing pipe ends and engaging the opposite ends of the insertible element, one of said coupling members being spaced about one of the pipe ends, a filling poured into the space between said coupling member and said pipe end to permanently seal said member to the pipe end, the other coupling member comprising a pair of ring sections having abutting faces and having oppositely inclined inner walls providing a substantial V-shaped interior groove, a filling poured into said groove and between said other coupling member and the opposite pipe end, and devices engaging through both coupling members and with the opposite ends of the insertible element and being adapted to secure the latter between the pipe ends, the rings of said other coupling being adapted to be separated whereby to expose said second filling for removing the same. Frank Du Mond, Rochester, New York,

U.S.A., 15th July, 1913; 6 years. Filed 26th March, 1913. Receipt No. 222,363.

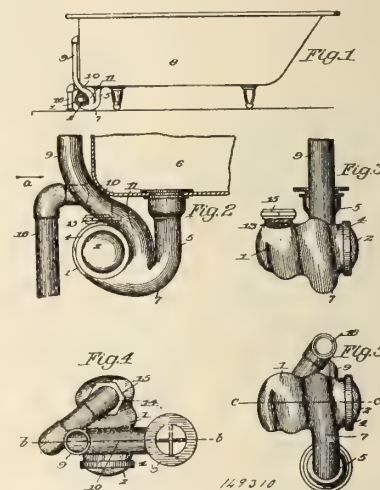
Claim.—1. An anti-syphon trap comprising a body elongated horizontally and substantially of uniform width throughout its length and having an inlet leading into the bottom thereof near one end on a tangent to the body, said inlet extending from a point above the body and making a lateral and upward bend prior to connecting with the body so as to provide a seal therein, and an outlet leading through the outer wall of the body at the opposite end thereof.

2. An anti-syphon trap comprising a body elongated horizontally and provided with an internal groove leading from one end of the trap to the other, an inlet extending from a point above the body, making a lateral and upward bend prior to connecting with the body so as to provide a seal in said bend, the inner end of

said inlet merging into the spiral groove at the bottom of the body near one end of the latter and on a tangent to said body, and an outlet leading through the top of the enclosing wall of the body near the opposite end, whereby the material is caused to flow in a spiral path about a horizontal axis from the inlet to the outlet.

3. An anti-syphon trap comprising a body elongated horizontally and provided with an inlet leading to one end of the body on a tangent, and an outlet leading from the body near the other end, said body being provided with an internal spiral groove leading from the inlet to the outlet.

4. An anti-syphon trap comprising an elongated body provided with an internal spiral groove leading from one end of the trap to the other, an outlet at the top



No. 149,310. Anti-Syphon Trap.

of the body, and an inlet pipe provided with a lateral and upward bend, said inlet pipe connecting with the bottom of the trap and having its inner end merging into the spiral groove.

5. An anti-syphon trap comprising a body elongated horizontally, a vertically arranged inlet bending laterally, thence upwardly and entering the bottom of the body near one end, on a tangent to the body to provide a seal below said body, a vertically arranged overflow bending laterally over the body, thence downwardly and connecting with the inlet between the body and the vertical portion of the inlet, and an outlet leading from the top of the body at the end opposite the inlet.

6. An anti-syphon trap elongated horizontally, a vertical inlet pipe extending from a point above the body, bending laterally, thence upwardly and entering the bottom of the trap near one end, on a tangent to the body, to provide a seal in the inlet pipe below the trap body, and an overflow pipe.

ANALYSIS OF CANADIAN SANITARY BY-LAWS.

(Continued from page 13.)

plumbing work to be done and must show partitions and methods of ventilating W.C. apartments.

If this Clause 16 is carried out to the letter it is all to be desired. It will result in each man employed having a good education first of all. It will mean that the contractor of sanitary and heating engineering will eventually become a more efficient mechanic.

How many who are to-day practicing in this line can draw a plan of their work? We venture to say very few and it is a state of affairs to be regretted. The reason that the sanitary engineer is not making the amount of money he should is because he is not master of the situation. He has to go to others to draw his plans, to take off quantities, etc., that is on the whole.

There are scores who do this themselves but these very men are making money, not the man who lacks the necessary education to do it himself.

If this clause is carried out it will be a blessing to the trade and in fact it would be better if the clause insisted that the plan should be drawn by the individual contractor himself or one of his regular staff.

One of the features of the examination papers should be that the applicant should be able to draw his own plans, except in cases where the journeyman or master has already proved himself efficient by actual accomplishments.

But all young men who are new applicants should have that condition to cope with. They should study draftsmanship and be taught to feel that it is just as essential as the wiping of a joint, which at one time was thought to be one of the chief qualifications. But we know now that the plumber is a craftsman of the past. There is another mechanic who can beat the plumber out and out at joint wiping and that is the man who wipes the lead covering of the telephone cables. He is no plumber, but is at present doing more joint wiping than nine plumbers in ten are doing. Yet this man knows nothing of sanitary engineering, and one of the reasons why we took the stand we did in changing the name of this paper was, we felt that the man who would efficiently carry on this class of work would be more of an engineer in every sense of the word, he would need more study, he would require to know more of the laws of gravitation, filtration, and water supply, as well as the science of sewage disposal. So we ought to hail with delight any measure which will tend to make our rising generation of craftsmen who follow this line more thorough. We should not fear the clauses which make for more study.

EXAMINING BOARD OF PLUMBERS.

ROCHESTER NEW YORK

RECORD TEST OF HOUSE TRAPS.

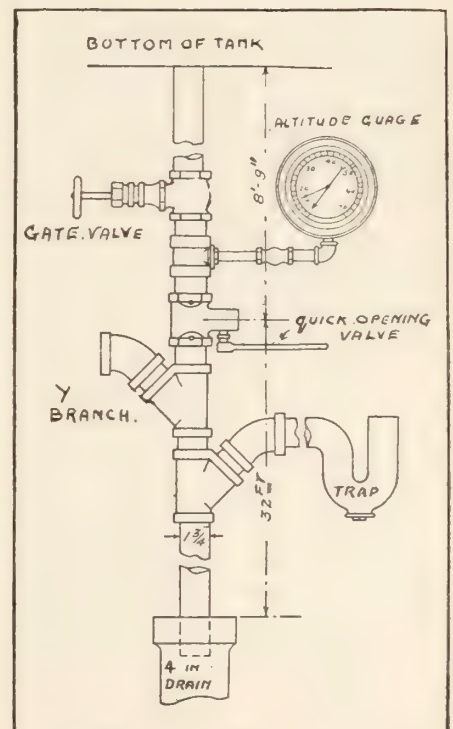
APRIL 28TH 1913

VARIETY & NAME OF TRAP	SIZE OF MATERIAL	DEPTH OF TRAP	WEIGHT OF SEAL	WEIGHT OF SEAL	WEIGHT OF WATER	WEIGHT OF SEAL	DEPTH OF SEAL	DEPTH OF SEAL	DEPTH OF SEAL
PUBLIC SAFETY	DITTO	BRASS	1 1/4"	4 1/4"	15 OZ	18 OZ	3 OZ	2 1/2 OZ	1/2 IN
SCHILO NO. 1	"	"	1 1/4"	7"	19 3/8 OZ	23 1/4 OZ	3 7/8 OZ	2 OZ	1/2 IN
H.J. AND C	"	"	1 1/4"	3 5/8"	19 3/8 OZ	21 3/8 OZ	2 OZ	1 7/8 OZ	3/16 IN
WOLVERINE 240 S.	"	"	1 1/4"	7"	19 1/8 OZ	20 1/2 OZ	1 3/8 OZ	2 1/8 OZ	1 5/16 IN
WOLVERINE CENTRIFUGAL TUBE IN. OUTLET	"	"	1 1/4"	4 1/4"	12 3/8 OZ	13 5/8 OZ	1 1/4 OZ	1 OZ	9/16 IN
MONARCH	"	"	1 1/4"	7"	19 1/2 OZ	23 OZ	3 1/2 OZ	1 3/8 OZ	7/16 IN
MONARCH	"	"	1 1/2"	6 3/4"	26 3/4 OZ	32 1/2 OZ	5 3/4 OZ	3 1/4 OZ	7/8 IN
H.J.C. H.A. JOCA	"	"	1 1/2"	3 1/4"	23 OZ	26 OZ	3 OZ	3 3/8 OZ	5/8 IN
I AND M	"	"	1 1/4"	5"	11 7/8 OZ	17 3/8 OZ	6 OZ	NONE	SEAL BROKEN
WAND W. SELO	"	"	1 1/4"	7"	25 3/4 OZ	27 OZ	1 1/4 OZ	1 3/4 OZ	1 3/8 IN
WAND W.	"	"	1 1/2"	7 3/4"	29 OZ	31 1/8 OZ	2 1/8 OZ	1 7/8 OZ	7/8 IN
BUCKEY SENACA	"	"	1 1/4"	6 5/8"	19 5/8 OZ	22 9/16 OZ	3 1/8 OZ	2 3/8 OZ	9/16 IN
SANITARY CO. PARAGON	"	"	1 1/4"	6 13/16"	17 3/4 OZ	21 OZ	3 1/4 OZ	1 OZ	1/4 IN

The writer was speaking to a man the other day who has for years taken off quantities, drawn plans, etc., for the trade. During the conversation he voiced his opinion that he intended at some early date to go into business. He would simply draw plans for sanitary and heating engineers; specify sizes of piping, fittings and boilers. He would then charge a small percentage. Now, if such a course is taken, what is going to be the outcome? It simply means that those engaged in the craft will never be more than joint wipers and pipe cutters and threaders: a most lamentable condition. So readers, devote more study to your plan drawing, conform to Clause 16 in every sense of the word and be master of the situation. We will treat with the balance of clauses in this by-law in a future issue.

NEW COMPANY ESTABLISHED.

Stratford, Ont.—Messrs. J. J. Robb, W. F. Rodgers and F. C. McLean, formerly with D. Kennedy, have opened up business as sanitary, heating and ventilating engineers. They will be known as "The Classic Sanitary & Heating Co.," situated at 164 St. Patrick St.,



Stratford. Our advertisers are requested to send catalogues and price lists to this firm at an early date.



A GOOD KINK.

Editor, Sanitary Engineer:

Dear Sir,—A few days ago I had an experience that may be of use to some of your readers. We were thirty-six miles from the shop completing a plumbing and heating contract in which we had to put up a few feet of eaves troughing. When it came to soldering the joints we found that the muriatic acid was mislaid, after trying everything I could think of without success, I got a little white vinegar and mixing it with sal-ammoniac obtained a very good flux for soldering the galvanized iron. I hope that this may help some one out of a fix some day as it did me. I am,

Yours,
J. W. R.,
Portage La Prairie,
Manitoba.

We beg to thank J.W.R. for this hint and hope our readers will take the same stand by sending in some kink or wrinkle, a good thing is too good to monopolize. When you are helping the other fellow you are helping yourself.—Editor.

HOW TO MAKE ADDITION TO SMALL HEATING SYSTEM.

Editor, Sanitary Engineer:

Dear Sir,—Enclosed please find sketch of a hot water system which I would like to have a little information about.

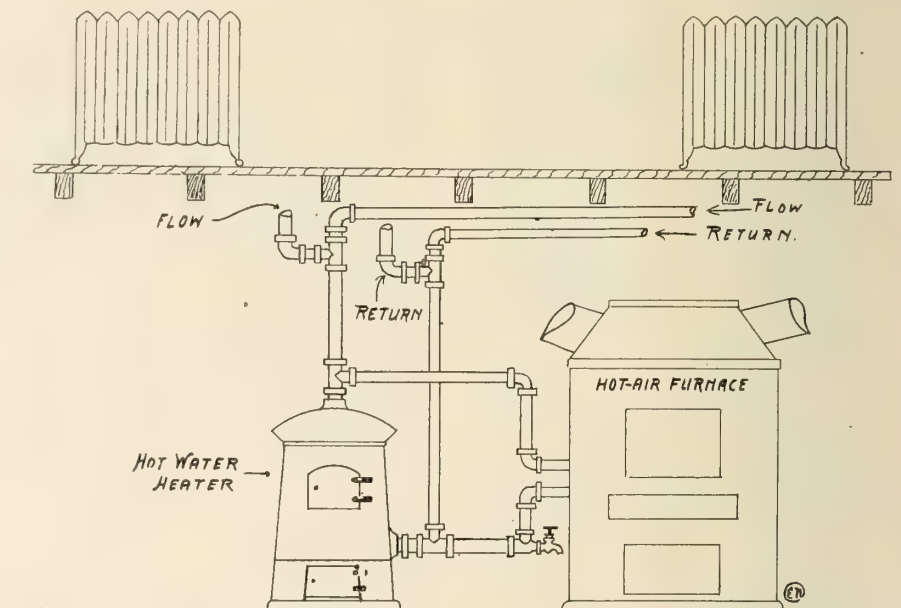
There is a hot air furnace in this house which does not give very good satisfaction. There has also been a hot water system to heat two radiators by way of supplying the shortage in heat. This too is not quite enough. I wish you could tell me if a coil placed in the hot air furnace could be connected up with the heater, and, if so, could you show how it can be done. An early reply will greatly oblige.

Yours truly,

F. R. E. O.

Replying to F. R. E. O., we may say your sketch is not quite clear. But we are herewith showing by Fig. 1 how this

addition should be made. You will note that the flow and returns of the coil which you propose placing in the furnace should be connected as close to the heater as possible. This method has been adopted several times where a tank heater was brought into service to assist in additional heating.—Editor.



ADDITION TO HEATING PLANT.

SCORCHING THE FLOOR.

Editor, Sanitary Engineer:

I am learning my trade with a man at present who is a splendid mechanic as far as I can see. He is very neat in the work he does, but one thing happens which seems to me should be overcome—that is, when he is wiping a flange joint on the wall or floor the solder scorches the floor sometimes, and especially if it is an old hardwood floor and there is oil in the wood, and sometimes the wall if painted, the paint gets burnt. Many a customer has made a kick on that account. Is there any way to prevent this scorching? A reply will greatly oblige.—Helper.

the piece in two very neat and place it round the pipe. Then take and tack it together at the corners so that the tacks can be easily removed, and not be in the way when wiping. Then when the joint is wiped, the millboard can be used again. It is well to get a flat tin box made to hold several pieces ready for each size of pipe.—Editor.

WHO'S SECRETARY.

Editor Sanitary Engineer:

Dear Sir,—I noticed in your last issue of The Sanitary Engineer, etc., under the heading of change of name of our craft that there is a Canadian Society of Domestic Engineers.

I would be much obliged if you could furnish me with the address of their secretary. I am dear sir,

Yours truly,

J. S. Kingston,

101 Cartier Street.

Ottawa.

We replied to our correspondent by return mail, but felt there may be others who are not quite conversant with the Canadian Society of Domestic Sanitary and Heating Engineers. Hence we here-with reprint the list as it appeared in our June 15th issue and which runs as follows:

Editor.

NEW OFFICERS APPOINTED

For Year 1914.

PRESIDENT:

Jno. McKinley, Ottawa.

VICE-PRESIDENT:

Jno. Watson, Montreal.

SECRETARY-TREASURER:

E. C. P. Holloway, Ottawa.

PROVINCIAL

VICE-PRESIDENTS:

ALBERTA:

E. McKnight, Edmonton.

BRITISH COLUMBIA:

J. S. Anderson, Vancouver.

NEW BRUNSWICK:

G. S. Dorman, Moncton.

PRINCE EDWARD ISLAND:

B. Shaw, Charlottetown.

NOVA SCOTIA:

J. E. Godwin, Halifax.

QUEBEC:

Jno. Gordon.

ONTARIO:

F. R. Maxwell, Toronto.

MANITOBA:

J. Hammond, Winnipeg.

SASKATCHEWAN:

N. B. Roantree, Swift Current.

CHAIRMEN OF COMMITTEES:

LEGISLATIVE:

J. T. Blyth, Ottawa.

SANITARY:

Jas. Marr, Calgary.

HEATING:

R. J. McCauley, Montreal.

APPRENTICESHIP:

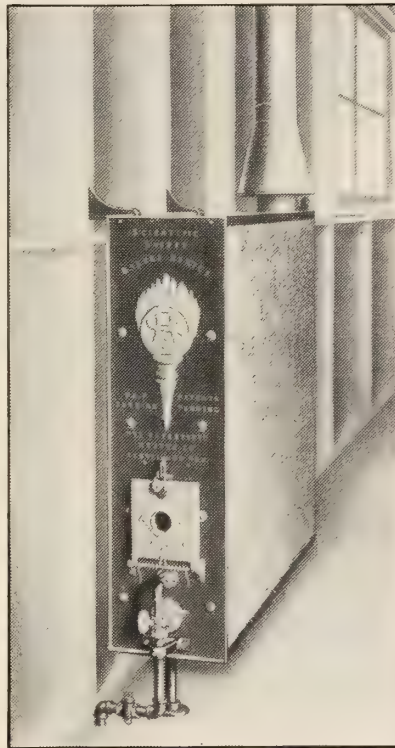
C. C. Crawford, St. John's, N. B.

ESSAY:

Jas. E. Walsh, Montreal.

NEW BOOKS.

The Scientific Heater Co., Cleveland, Ohio, have recently issued a very interesting book on the heating of garages. This is a problem of vital interest to all users of cars, and the method which



GARAGE HEATER.

must be adopted on account of the possible leakage of gasoline, and also the storage, will need to be one which will ensure no igniting of the said gasoline. This book is very nicely gotten up, and can be procured free by writing The Scientific Heater Company, Cleveland, Ohio.

NEW W.C. CONNECTIONS.

Old fashioned plumbing devices are bound to be superseded by up-to-date inventions. A notable instance of this truth is the lead bend connection which is doomed to become an obstacle as enclosed plumbing, if the present rapid adoption of a new type of fitting may be taken as an indication of future conditions. These are the claims made for this new fitting.

It is said that this fitting, which is known as the J-M Sanitary Closet Fitting, saves labor, time and money because it can be installed in less than half the time ordinarily required. And it never requires the slightest attention after installation, whereas the old-fashioned lead bend oxidizes in a few years and goes to pieces.

It eliminates all lead connections under the floor and permits all the flexibility

the plumber desires. The makers assert that it can be quickly screwed or calked into any stack and that, as it can be turned to any angle, it is very simple work to connect with any closet.

The remarkable feature in connection with this fitting is that it is made with a number of flanges on each end. The flanges are $\frac{3}{4}$ inch from centre to centre and have the appearance of corrugations running around the fitting. In case the fitting is too long on either end it can be readily shortened by simply cutting off one or more of the flanges with a cold chisel and a hammer.

The Canadian H. W. Johns-Manville Co., Ltd., Toronto, manufacturers of the



J-M Sanitary Closet Fitting, claim that it will last as long as the building in which it is installed, and they guarantee joints to be absolutely gas-tight after being made up. This company, which is well known in the plumbing field, has published an interesting booklet on the above subject, and will be glad to forward a copy of same upon request to anyone interested.

PLANS OF WORK RECENTLY INSTALLED IN A CANADIAN PUBLIC SCHOOL.

(Continued from page 18.)

turn, when sanitary and heating engineers, who are anxious to put up a good installation, will receive better encouragement from the public at large; when it will be necessary for each and every one engaged in the craft to prove in some tangible way that they are thoroughly qualified to instal such work properly, so that no lives are endangered; that men who are appointed inspectors of such work will be men who are not only experts, but who have the true cause of sanitation at heart.

In our next issue we will produce the plans of the rest of this installation under the same heading.

Market Reports

TORONTO.

There is a decided lull being experienced in the trade as a whole in and around this city. Most of the large contracts are completed, and all residences are now closed up as regards alterations or additions of any note. The last month or six weeks a great deal of repair work has been done, but even this class of work is quieter now.

The trade as a whole, though, are looking ahead for better times. Business men are very optimistic on account of the news that crops were good.

Then, again, money is felt to be a little easier. There are numerous inquiries for quotations on hand, thus showing that abundance of work is being planned.

The metal market is firmer, and one large manufacturer stated that trade was, if anything, rather brisker than expected at this period of the year.

Enamelware.—Is easier as regards demands, though inquiries for prices are very active. Higher class goods are asked for than previously call for.

Brass Goods.—Stands at no change in prices. Manufacturers are devoting considerable time in preparing new lines and improvements.

Black and Galvanized Pipes and Fittings remain the same as last week. No great demand is being made for this line, and no changes are reported in prices.

Boilers and Radiators.—This commodity has had a very good run this year, and bigger demands are expected next season. One manufacturer stated this had been the biggest year they have experienced, and that even now they felt a slight shortage, particularly on boilers, though on some sizes they were just now beginning to make up for stock.

Soil Pipe and Fittings remain the same, and no great demand is being felt. We are informed, though, that this has been the biggest season for years, and that several large shipments came from the other side to ease the situation, which will not happen next year. Manufacturers propose holding their own this coming year.

Other lines of goods used are about the same as last reported, though collections are, if anything, slower than previous.

Enamelware.—The demand has been exceptionally good in this line, and one of the leading firms whose business had fallen off in another line say that in-

creased business in enamelware has more than offset the deficit in the other line.

Brass Goods.—The general impression is that the amount of business passing is very fair for this season of the year. Repair work is prominent.

Black and Galvanized Pipe.—The market here is quieting down owing to the heating contracts having been completed. The demand is only fair at present, and prices remain unchanged.

Soil Pipe and Fittings.—Quite a number of inquiries have been received of late, and although the orders have not come up to the inquiries by any means, the trade anticipates a briskness in this market in the near future.

Lead Pipe.—The price of lead pipe remains unchanged. Stocks are said to be low owing to winter supplies being sent out by water routes in order to take advantage of the low rates before the season closes. Business is keeping up pretty well in this line.

Solder.—Just a quiet business passing with prices remaining the same. No change is looked for.

MONTREAL.

Montreal.—There seems to be a little difficulty experienced in collections, but when it is taken into consideration that the retail man is experiencing the same difficulty with his customers, the wholesalers seem to be satisfied that the present embarrassment is only of a temporary nature.

The heating business has quieted down considerably, as most contracts have been completed, and work of a repair nature is now being carried on. The plumbing business is also confined to repair work. Locally, these two lines were not rushed quite so much this year owing to the building operations not being quite so extensive as in previous years. It is claimed though, by some, that building will be carried on on a large scale next year, and it is hoped that it will show such an increase that the poor season just passed will be forgotten.

SANITARY ENGINEERS' PROBLEMS IN WINNIPEG.

(Continued from page 12.)

larly the case in buildings which have remained empty throughout the winter without being heated. Where such conditions have existed it is not uncommon to find that with the exception of the external walls the whole building has been raised 3, 4, and in extreme cases as much as 6 inches, due to the moisture in the ground under the building freezing and expanding. You can readily imagine that this works havoc with the

plumbing system, lead joints in soil pipes are pulled apart, water pipes are broken, and the writer has known instances where 6 in. by 6 in. wooden beams have been snapped in two just as you would break a match.

The foregoing are a few of the more important difficulties we have to contend with in this northern clime, and which come to mind at this writing. There are many others, however, which are also experienced in less severe climates, and which have to be considered as being the work of the plumbing inspector or sanitary engineer.



PLAIN HIGH COST OF LIVING REASONS.

When the editor of a Missouri newspaper was asked for the reasons for the high cost of living, he wrote the following:—

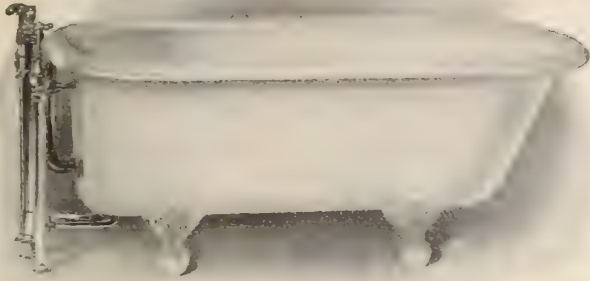
"A gentleman requested that we publish the cause of the high cost of living. Our views in a condensed form are that we've let a lot of timber go to waste and are now buying wire fences and lumber from foreign countries; we throw away our grease and ashes and buy our soap; we raise too many dogs and buy too many hogs; we raise too many weeds and buy too many vegetables; we catch a 5-cent fish with a \$4 rod; we build a schoolhouse and send our children off to be educated; we send our boys out with a \$40 gun and a \$10 dog to hunt 5-cent rabbits and 10-cent birds, and lastly we mortgage our homes to buy four-priced automobiles that we don't know how to operate or keep up. It is the cost of 'high living,' and not the high cost of living, that ails this country."



CHANGE YOUR DISPLAY.

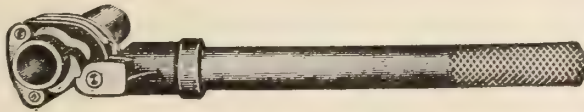
(Continued from page 11.)

around so as to make an enclosure. We are here producing a view of the suggestion. The stationary bathroom equipment is rather an expensive affair and not only so but, if it is gotten up in the way most are, it will need to be permanent which in some stores, where room is limited, would be a very great inconvenience. But this idea would be a knock-down affair and could be altered in size to suit the display—by simply adding to the length of pipe or—cutting a piece off as the case might be. The actual area need not be altered. Thus the same curtains may be used. Changing the display in one's showroom is bound to attract the public in no small way, and often creates a desire to make a change in bathrooms or kitchens as the case may be.



Make Satisfaction Double Sure By Selling Our Quality Goods

We have everything the Sanitary Engineer requires, and our prices leave a good margin for profit. Our guarantee is your safeguard. Your inquiries will receive prompt attention.



The Parmalee Pipe Wrench

The Wrench That Will Make Or Break The Tightest Joints Without Injuring Pipe or Threads.

This pipe wrench has no teeth, but has a grip that will surprise you. The best to use with galvanized, nickel-plated or brass tubing. Will save its cost in a very short time.

The James Morrison Brass Mfg. Co., Ltd.

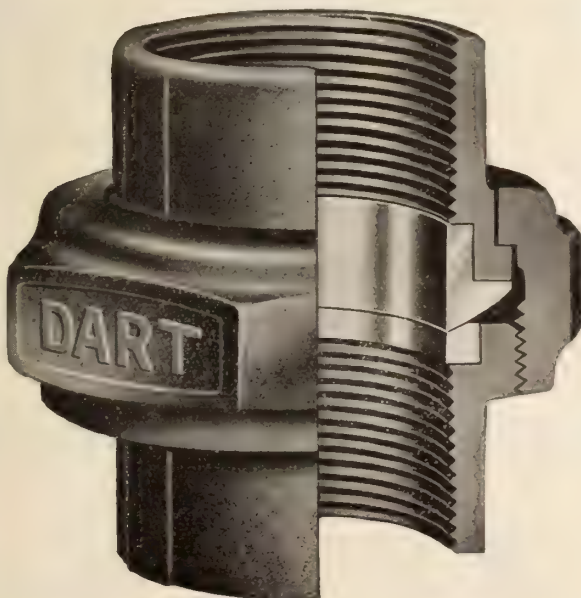
93-97 Adelaide St. West, TORONTO



Your Customer wants pipe connections that will not leak

for a leak invariably means annoyance and expense to him. His interest is your interest.

Safeguard his interest. Every connection you make with a



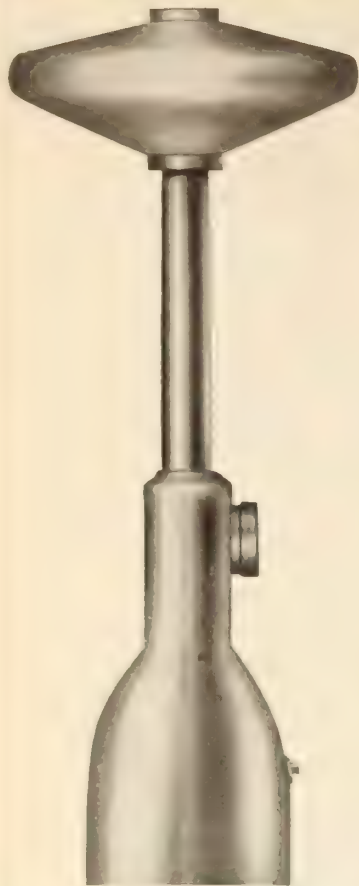
"Dart" Union Pipe Coupling

is tight and stays tight until deliberately loosened. They are easily joined and rejoined. Made heavy of malleable iron with a bronze to bronze ground ball joint. That's why they last and are so easily reconnected; there's no rust at the vital part of the union. The ball joint cares for any non-alignment of the pipe.

Simple, sure and lasting unions. Always intact and ready for you to use and a positive assurance for your customer against trouble and expense.

Use Dart couplings. Your own jobber sells them.

Dart Union Company, Limited
TORONTO CANADA



MADE *in* ENGLAND

Honeywell Heat Generators are now made at Birmingham, England, from which point the requirements of Great Britain, Europe and Asia are supplied.

In 1906—seven years ago—the first Honeywell Heat Generator was made for sale at Wabash, Ind. During that first year exactly 1,618 Honeywell Heat Generators were manufactured and sold to fitters in the United States.

In 1907—the year of the panic in the U.S.—exactly 5,257 Honeywell Heat Generators were made and sold in America. Since that time the demand has increased to such an extent that during one month of last year there were almost as many Honeywell Heat Generators sold as were made during the entire year of '07.

In 1908 there came a demand from foreign countries for Honeywell Heat Generators; this demand grew until we decided to manufacture our Generators in England to properly supply foreign requirements.

This great, and constantly increasing demand proves better than anything else the merits of the only absolutely safe and dependable seal for hot water heating systems—the Honeywell Heat Generator. You should know all about it and how it is used in connection with the Honeywell method of piping.

If you haven't a copy of our fitter's handbook, write for one. It tells all about Honeywell Hot Water Heating.

Honeywell Heating Specialty Co.

1008 Eastern Townships Bank Building
MONTREAL

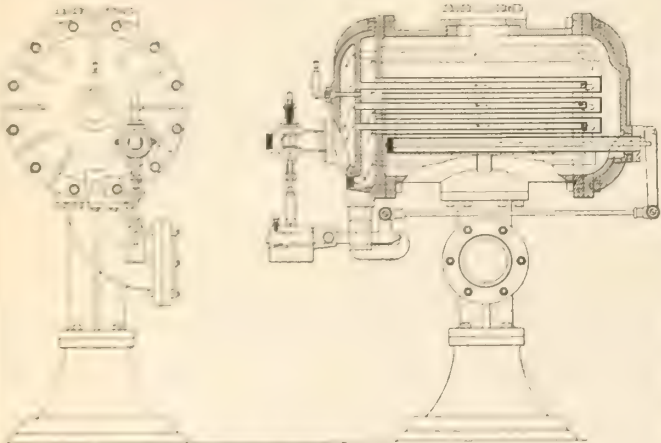
WABASH, IND.

BIRMINGHAM, ENG.

NEW YORK, N.Y.

The "Manny" Heater

Affords Every Aggressive Steamfitter An Excellent Opportunity to Make Large Profits



The Manny Heater is connected to a hot water system as the ordinary hot water heater, and steam is carried to it from a boiler house stationed outside the main building, at regular boiler pressure, but reduced at every heater by a steam pressure reducing valve to 20-15-10-5 lbs., or as low as one pound to the square inch, according to temperature required in the building. The steam is carried to the Manny Heater from the boiler room by a single pipe.

This heater is a most economical way of heating large buildings. Many furnaces can be eliminated and much space saved. Supplied with or without Thermostats. Notice how provision is made for the expansion and contraction of the Thermostatic Joints.

Let us give you full particulars, regarding this newest and best method of heating. Write for descriptive catalog F.

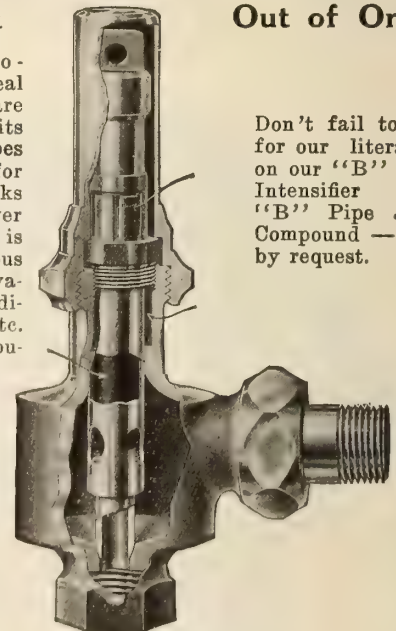
The E. S. Manny Co., Montreal

NATIONAL VALVES

Are Ordered and Reordered
—Never Get Out of Order

National Thermostatic is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent.

More merits about the valve by writing for more information.



Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

NATIONAL STEAM SPECIALTY CO.

24-26 S. Clinton Street.

Surplus, Dunn & Co., 74 Murray Street.

L. N. Vanstone, 8 Wellington St. East, Toronto.

Endress, Limited, Scott Building, Winnipeg.

CHICAGO

NEW YORK

Moncrieff &

"When writing ad artists please mention that you saw their advertisement in the *SANITARY ENGINEER*."



Nye the Die Man

The Strong Man Asks No Favors

When he tackles a piece
of work he does it.
Nothing Buffaloes him!



$\frac{3}{4}$ in. 1 in. $1\frac{1}{4}$ in. Wrench 2 in. $1\frac{1}{2}$ in.
Price 75 cents net each

**The Nye Union Valve Nipple Wrench Is
Like a Strong Man. It Works**

It is made of the best material. It never slips. It is light and easy to handle. It does not mutilate the nipple.
It lessens the profanity output and tickles like a feather duster.

I don't ask you to believe in the superiority of the Nye Wrench until you have been shown. Drop me an order and I'll ship you the tool on a free trial. It is so different from the cat, it will never come back.

The Nye Tool and Machine Works

124 N. Jefferson St.,

Chicago, Ill.

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, $\frac{1}{8}$ IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES

Black and Galvanized
All Sizes

Ask your jobber for



Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal

Works: Lachine Canal

TWO CENTS PER WORD

You can talk across the continent for two cents per word with a WANT AD. in this paper.

PEASE IDEAL STEAM BOILERS

Write to-day for Catalogue and Prices.

Pease Foundry Company
LIMITED

Works: Brampton. Head Office: Toronto.
Branches: Vancouver, Winnipeg, Hamilton,
Montreal.

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Asbestos Goods.

Aluminum Casting.
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Canada Metal Co., Toronto.

Brass Castings.

Tallman Brass & Metal Co., Hamil-

ton.
James Morrison Brass Mfg. Co.,

Brass Goods, Valves, Etc.

James Morrison Brass Mfg. Co.,

Wallaceburg Brass Mfg. Co., Wallace-

burg.
Empire Brass Mfg. Co., London.

Dunham, C. A., Toronto.

Brass Pipe and Tube.

Empire Brass Mfg. Co., Toronto.

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ton.
Canada Metal Co., Toronto.

Boilers, Steam or Hot Water.

Steel & Radiation, Ltd., Montreal.

Pease Foundry Co., Ltd., Toronto.

Burners.

Standard Heating & Radiator Co.,

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Anglo-American Sanitary School.

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National Equipment Co., Toronto.

Leader Iron Works, Chicago.

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James Morrison Brass Mfg. Co.,

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Galt Brass Co., Galt.

Amherst Foundry Co., Amherst, N.S.

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Fittings, Limited, Oshawa.

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James Morrison Brass Mfg. Co., To-

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Kerr Engine Co., Walkerville.

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Montreal.

Steel & Radiation, Ltd., Toronto.

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Dunham, C. A., Co., Toronto.

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Dart Union Co., Ltd., Toronto.

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Canadian Tap & Die Co., Ltd.

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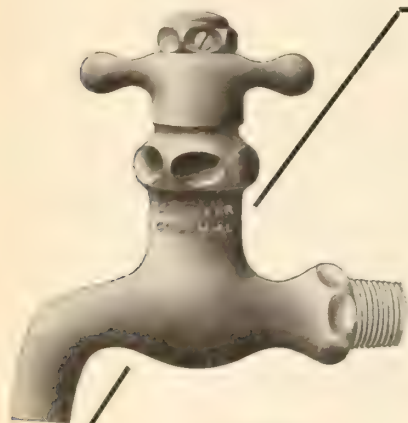
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Dart Union Co., Ltd., Toronto.



I 12002

The greatest self-closing work the plumbing trade has ever known—artistic in appearance—perfect in mechanism.

Mueller Colonial

Made In Canada

Big users everywhere are adopting Mueller Colonial Self Closing Work. It prevents waste, cuts down repair bills, lessens water bills and gives PERFECT SATISFACTION.

Every user of Mueller Colonial Self Closing Work becomes your friend.

Made in basin cocks, stop cocks, urinal cocks, etc.

All Mueller Goods are UNCONDITIONALLY GUARANTEED — that means perfect goods for you.

H. MUELLER MFG. CO., Ltd.

Sarnia, Ontario, Canada.

**H.
Mueller
Mfg. Co.
Ltd.
Sarnia, Ont.**

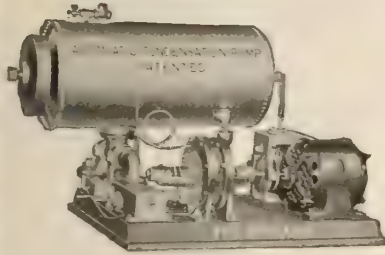
Please send booklet
and further informa-
tion regarding Colonial
Self Closing Work.

Signed.....

City.....

How to Place Radiation Below Water Level in Boiler

Save Digging a Boiler Pit and 20-50% Coal



Write for Catalog D, giving the above information and describing the

"CHICAGO"

Condensation Pump and Tilting Tank Receiver.

CHICAGO PUMP COMPANY

915 W. Lake Street, CHICAGO, ILLINOIS

Mechanical Drawing

By **Ervln Kenison, S.B.**

Instructor in Mechanical Drawing, Massachusetts Institute of Technology

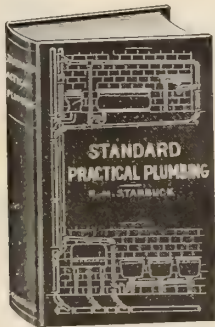
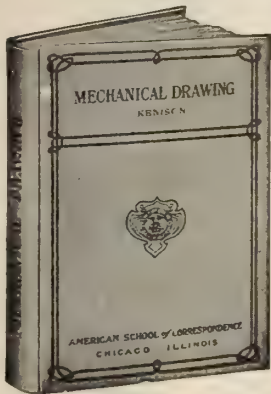
176 pp., 140 illus. Cloth binding. Gives a course of practical instruction in the art of Mechanical Drawing, based on methods that have stood the test of years of experience. Includes orthographic, isometric and oblique projections, shade lines, intersections and developments, lettering, etc., with abundant exercises and plates.

Price, \$1.00

MacLean Publishing Co.

Technical Book Dept.

143-149 University Ave., Toronto



A WANTABLE BOOK

Standard Practical Plumbing

By **R. M. Starbuck**

347 SPECIALLY MADE ILLUSTRATIONS

PRICE \$3.00

"Standard Practical Plumbing" is indispensable to the Master Plumber, the Journeyman Plumber, and the Apprentice Plumber. As the book is specially strong in the exhaustive treatment of the skilled work of the plumber, it commends itself at once to every one working in any branch of the plumbing trade. Send for it to-day.

TECHNICAL BOOK DEPARTMENT

MACLEAN PUBLISHING COMPANY

143-149 UNIVERSITY AVENUE - TORONTO

A Three-Barrelled Challenge.



1st.

We challenge any Plumber, any time, anywhere, or any gas-fitter or electric-conduit fitter, to use the T. R. I. O. Pipe Stock for one week, without becoming its friend.

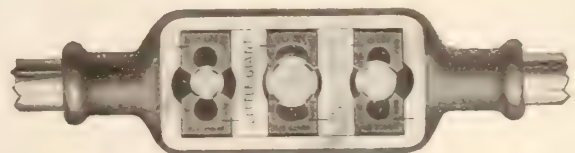
2nd.

We challenge any Plumber, any time, anywhere, or any gas-fitter or electric-conduit fitter, to use the T. R. I. O. Pipe Stock for one week and retain a **grouch** over ill-fitting joints.

3rd.

We challenge any Plumber, any time, anywhere, or any gas-fitter or electric-conduit fitter, to use the T. R. I. O. Pipe Stock for one week without placing its value higher than its price.

Your dealer is authorized to make this challenge good.



The Keenest Little Helper That a Plumber Ever Had.

Canadian Tap & Die Co.
LIMITED
GALT, ONTARIO

Send and get "The Emancipation of the Plumber," a little book on pipe threading and "traditional fallacies."

Condensed or "Want" Ads.**SITUATION VACANT**

WANTED—A PLUMBER, A TINSMITH AND a hardware clerk. Cameron & Leacock, Smith's Falls, Ont. (17tf)

WANTED — ONE FIRST-CLASS STEADY plumber for Eastern Canada. Permanent job for right man. Apply to Box 42, Sanitary Engineer, Toronto. (22)

GOOD OPPORTUNITY

PLUMBING, TINSMITHING, STOVE AND Hardware Business for sale, in Grimsby Village. Apply 752 King Street East, Hamilton, Ont. (19)

WANTED

WANTED—HOT WATER BOILER SUIT-able for 8-roomed house. Must be in good repair. State size and price. Apply to Norman Brooks, Box 245, Fergus, Ont. (24)

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The Editor wishes every one interested in
**Domestic Sanitary
Heating and
Ventilating
Engineering**

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

STUDY**These Uncrowded Professions**

Sanitary Science and Engineering, Sanitary Inspectorship, The Science of Plumbing, Hygiene, under the directorship of Prof. Arthur Bateman, M. Inst. S.E., A. R. San, I., M. I. P., R. P. C., Eng

SUCCESS GUARANTEED.

Write for free booklet.

Desk 3

Anglo-American Sanitary Correspondence College, 10-12 W. Ontario St., Chicago, Ill.

When writing advertisers kindly mention having seen the advertisement in this paper

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FOR
SEPTIC TANKS**

WATSON AND PAUL
93 St. Genevieve Street, Montreal

**GENUINE
ARMSTRONG STOCKS
and DIES**

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,
both Hand or Power

HINGED PIPE VISES

PIPE CUTTERS

PIPE WRENCHES

RATCHET ATTACHMENTS

BARD ADJUSTABLE
BUSHINGS

Manufactured by

**THE ARMSTRONG M'F'G.
CO.**

317 Knowlton St.

BRIDGEPORT, CONN., U.S.A.
NEW YORK CHICAGO

WRITE FOR CATALOG

**No
other
needed!**



A Williams' "Agrippa" Chain Wrench will assuredly save your buying and carrying an extra tool because of its universal adaptation to both pipe and fittings work.

The close-to-the-ceiling and the pinched-for-space propositions are all "meat" for the Williams' "Agrippa" single jaw.

If you had but one dollar to spend and an endless number of tools to choose from, you could not "go wrong" on a Williams' "Agrippa." An "Agrippa" will do everything that is possible with any other sort of pipe wrench and much more.

The reliability, both for strength and service, is established before it goes to you—We prove it by test, and the price is in your favor, too.

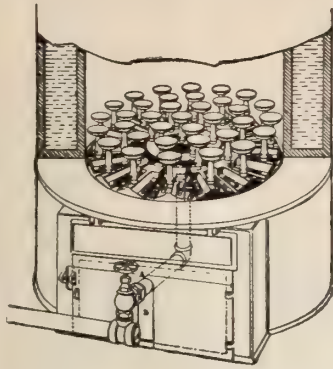
Go to your dealer for tools on trial. Return 'em if not as represented.

J.H. Williams & Co.

Superior Drop-forged Tools

77 Richards St., Brooklyn, N.Y. City

40 So. Clinton St., Chicago, Ill.



Many years of continuous manufacture and the installation of the "STANDARD" GAS SAVING BURNERS in all makes of Steam and Hot Water Heating Boilers and Hot Air Furnaces makes it possible for us to obtain the best results in quantity of heat obtained for the amount of gas consumed.

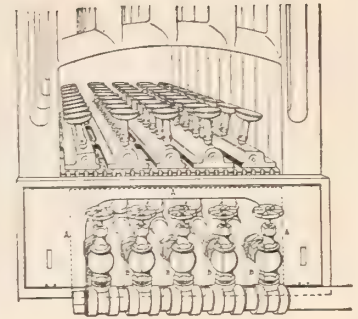
"STANDARD" Gas Saving Burners are also especially adapted for automatic regulation of temperature, and easily controlled by hand regulation.

The "STANDARD" GAS SAVING BURNERS are durable and reliable.

STANDARD HEATING & RADIATOR CO.

MANUFACTURERS

Cor. Penn Ave. and Third St., Pittsburgh, Pa.

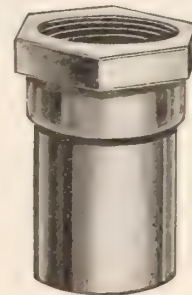


SEND US
A SAMPLE
ORDER



**We Manufacture
"Imperial"
Soldering Nipples
of Quality**

One trial will convince you
that we make the best nipples
you ever saw



WE MAKE
THE BEST
ONLY

THE CANADA METAL CO., LIMITED

FRASER AVENUE TORONTO

50 BRENNAN STREET MONTREAL

301 CHAMBERS STREET WINNIPEG

BOOKS FOR SANITARY ENGINEERS

Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

Sanitary Engineering of Buildings

BY

WM. PAUL GERHARD, C. E.

Consulting Engineer of Sanitary Works

Member Am. Public Health Association.

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103 Illustrations

6 Plates

Deals with Defective Plumbing and Sewer Gas, Traps and Systems of Trapping, Drainage and Sewerage of Buildings, Plumbing Fixtures, Sewage Removal and Disposal, Improved Methods of House Drainage, Proper Arrangement of W.C. and Baths, Sanitation in Factories and Workshops, Sanitary Drainage of Tenement Houses, Testing House Drains and Plumbing Work, Simplified Plumbing Methods.

A Volume of 455 Pages.

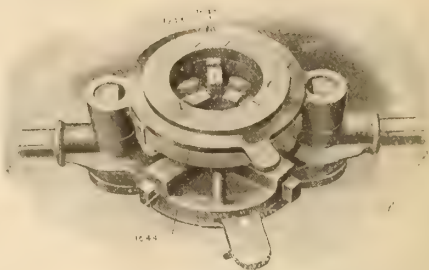
TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co., 143-149 University Ave., Toronto

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Every Additional Pound of Energy

you put into your work, reacts at the end of the day in tired and aching muscles, in that "all in" and "me for the hay" feeling. It's up to you, therefore, to see that you make all your energy count, to see that you don't put pounds of needless exertion into pulling one of those old-fashioned wide die stocks. Get a



Premier Die Stock

with the narrow, automatically receding dies and save up that extra energy to enjoy yourself with in the evenings.

In the Premier the dies start in on the pipe at full depth of thread and then back themselves off automatically. When they're cut the right length, they open out and you just lift the die stock off the pipe.

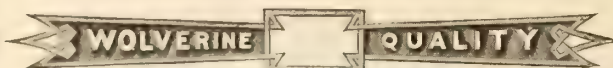
The patented offset die allows all this to be accomplished without the use of a lead screw or nut.

No. 1 Premier threads $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. right and left hand dies extra.

No. 2 Premier threads 1 in. to 2 in. right or left hand, with the same dies.

Drop in at your dealer's and look at one.

BORDEN-CANADIAN COMPANY, Toronto, Ontario



Wolverine "One Piece" Basin Supplies

(Patented)



Separate Wolverine Flexible Joint Connection. Furnished on any $\frac{3}{8}$ -inch I.P. Basin Supply by specifying "C" after figure number.



Lead Cone Packing. Furnished on any Supply instead of Rubber by specifying "L" after figure number.



1-inch I.P. Tall Piece. Furnished on any $\frac{3}{8}$ I.P. Basin Supply by specifying "R" after figure number.

Special annealed brass tubing with slip joint nut for $\frac{1}{2}$ -inch iron pipe or with $\frac{3}{8}$ -inch I. P. Thread for floor or wall connections.

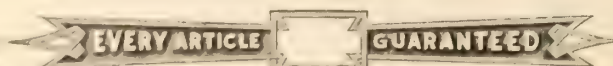
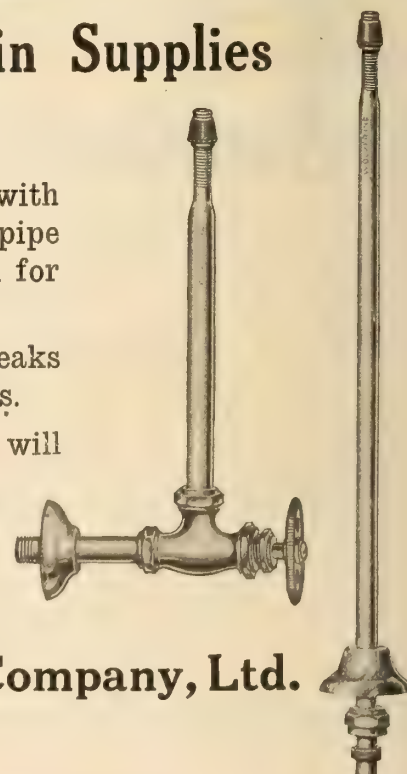
The Flexible Joint eliminates leaks at connections under the basins.

Heavy deep flanges which will not ding, as is often seen with inferior fittings.

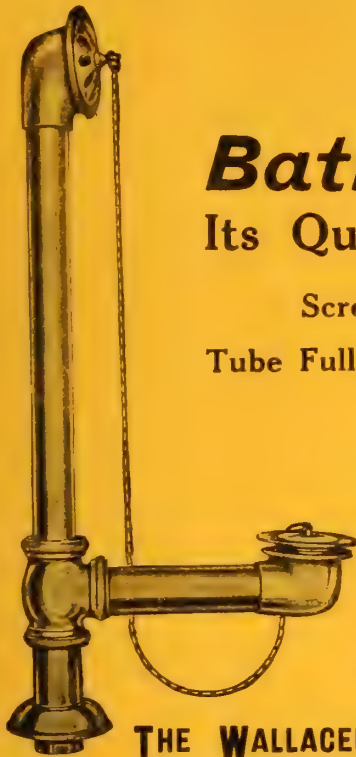
Manufactured by

Canadian Wolverine Company, Ltd.

Chatham, Ont.



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Get The
SYDENHAM
BRAND

Bath Waste and Overflow Its Quality Guarantees Universal Satisfaction

Screwed—Not Soldered Connections.

Tube Full One Three-Eight Inches In Diameter.

Heavy Cast Parts.

Flange on Top Elbow to Hold
Rubber Gasket in Place.

Write us for Catalog on Complete
Line of Brass Goods.

Sold by
Jobbers
from
Coast to
Coast

THE WALLACEBURG BRASS & IRON MANUFACTURING CO., LIMITED

No. 3008

WALLACEBURG, ONTARIO.

Toronto,
L. N. Vanstone,
8-10 Wellington St. E.

Winnipeg,
Moncrieff & Endress, Ltd.,
Scott Bldg.

Montreal,
J. R. Devereux,
142 St. Joseph Boulevard West.



This is The Radiator Valve You Have Been Waiting For

An absolutely PACKLESS valve, with no composition rubber rings or discs in the bonnet to take the place of packing.

An all metal valve with accurately ground cone joint in bonnet, which will not score, cut or become unevenly worn, as the spindle bearing runs the length of the bonnet spindle cavity.

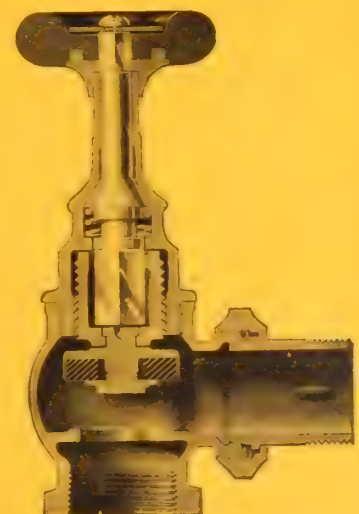
No strain on the stem or stem seat at any time other than the tension of the phosphor non-corrodable spring which holds it in its place.

All the thrust is against the threads on the disc carrier and in the heavy bonnet. The stem simply acts as a KEY to revolve the disc carrier. No inexperienced person can tamper with the working parts of this valve, as they are all

securely locked inside the valve.

Every valve tested with steam, and we guarantee them to be tight.

Give this valve a trial on the next vacuum job or high class steam heating plant.



The Kerr Engine Company, Limited,
Valve Manufacturers,

WALKERVILLE,

ONTARIO

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes



No Time Lost
Connecting
THE
"ADJUSTO"

Cast Brass Strainer
Cast Brass Waste Plug
Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT, CANADA



Sitz Bath Set of Bell Supplies and
Waste

The Figuring of time is al-
ways the Sticker on any job

On any large contracts there is always an allow-
ance made for unforeseen troubles over and above
the possible minimum time.

If you want to minimize this item and add it to
your profits use

EMPIRE PLUMBING GOODS

All our fittings are made to standards and thor-
oughly tested and inspected before leaving the
factory and are guaranteed to fit exactly the fix-
tures they are intended for.

If you have not used them, specify them in your
next order, if you have, we know you will continue
to use them.

Empire Mfg. Co., Ltd.

Head Office and Factory, LONDON, Ont.
Montreal Office, Room 31, C. P. R. Telegraph Bldg.
Winnipeg Office, 109 Carlton Block, Portage Ave.

THE SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

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TORONTO, 143-149 University Ave.
CHICAGO, 140 S. Dearborn St.

WINNIPEG, 84 Royal Bank Building
NEW YORK, 115 Broadway

Vol. VII.

Publication Office : TORONTO, DECEMBER 15, 1913

No. 24



THE STANDARD

COMPANY LIMITED

GENERAL OFFICES AND FACTORIES · PORT HOPE · CANADA





PLATE F370.

PORCELAIN Enameled Flat Rim Laundry Tray and Sink Combination, with one-piece separate back on painted pedestal and sink bracket, strainer, waste plug and rubber stopper, Fuller bibbs and 1½" "P" Traps.

Size of Sink	18"x30"
F370A, as described	\$42.25
F370, less bibbs and trap	27.75
For 20"x30" size sink add	1.50

Ideal Flat Rim Laundry Tray and Sink Combination

A NEW DESIGN
AT A
VERY LOW PRICE.

WRITE FOR CIRCULAR.

TORONTO
119 KING STREET EAST

MONTREAL
42-44 BEAVER HALL HILL

WINNIPEG
76-82 LOMBARD ST.

VANCOUVER
410 CARTER COTTEN BLDG.

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER

Beaver Brand Cast Iron Enameled Ware

Unsurpassed for Pure Whiteness of Color,
Attractiveness of Design, Finish and Durability.



The above cut shows one of our many styles of lavatories.
These goods are very much appreciated by the trade.

Buyers who want the best, insist on **Beaver Brand Goods**.

Amherst Foundry Co., Limited

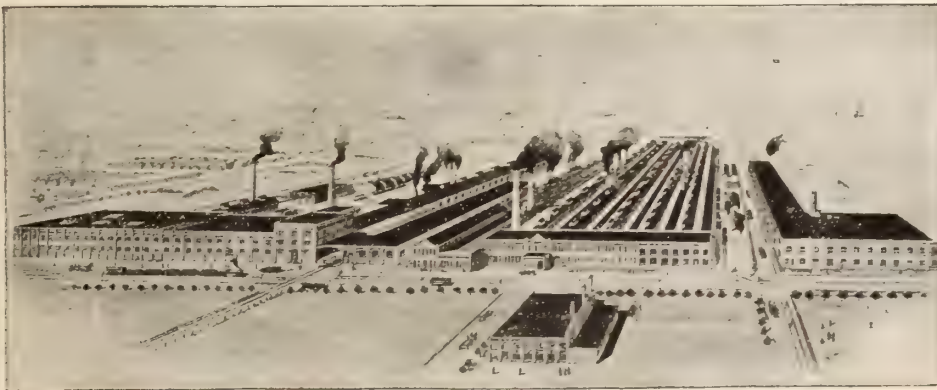
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co.,
178 Victoria St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes,
120 Lombard St., Winnipeg

BRITISH COLUMBIA:
A. O. Campbell,
864 Cambie St., Vancouver



GENERAL OFFICES AND WORKS :

FITTINGS LIMITED, OSHAWA, CANADA

WAREROOMS :

MONTREAL WINNIPEG VANCOUVER

CATALOG FURNISHED UPON REQUEST



"When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER."

"Standard Sanitary"

Modern Bathroom



Design P-60.

The bathroom illustrated above is an extremely well planned interior for a moderate sized house. The entire equipment, while inexpensive, is most satisfactory and practical.

The Closet Bowl is of the "Standard Sanitary" "Vitrite" porcelain, the surface of which is hard, smooth and non-absorbent, therefore highly sanitary, while the Tank is porcelain enameled.

Our long experience has particularly demonstrated the special fitness of porcelain enamel as the ideal material for Closet Tanks.

Enameled Tanks will not sweat, crack, need no lead, copper or other lining, and will not rust. There is no wear-out to the porcelain enameled Tank.

"Standard Sanitary" plumbing fixtures can be obtained from all leading plumbers, and are carried by jobbers and sales agents throughout the Dominion.

Standard Sanitary Mfg. Co., Limited

General Offices and Factory:
ROYCE AND LANSDOWNE AVES., TORONTO, ONT.

Toronto Store:
55-59 Richmond Street East.

Hamilton Store:
20-28 Jackson Street West.

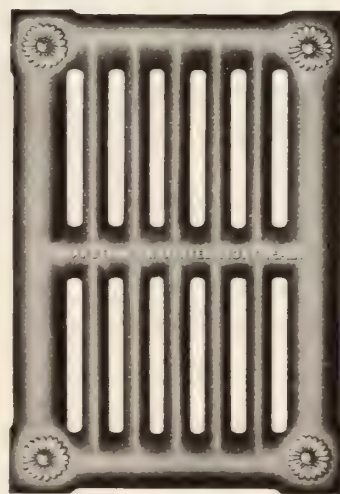


Just Out!

The New

“VIKING”

RADIATORS



These are the latest additions to our products, and are the neatest Radiators on the market to-day. They are fully described in our new Catalogue. Send for a copy at once.

We are the sole manufacturers of the celebrated “Daisy” Hot Water Boiler. Over 50,000 in use. This speaks for itself, and repair parts, if necessary, for any of the different styles, may be obtained at once.

WARDEN KING LIMITED, MONTREAL

Branch, 200 Adelaide St. West, TORONTO

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IN
CANADA

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The MECHANICS' SUPPLY CO., Limited, QUEBEC, QUE.
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Above illustration taken from cover of the "Leaderite," December issue, published monthly by the Leader Iron Works.

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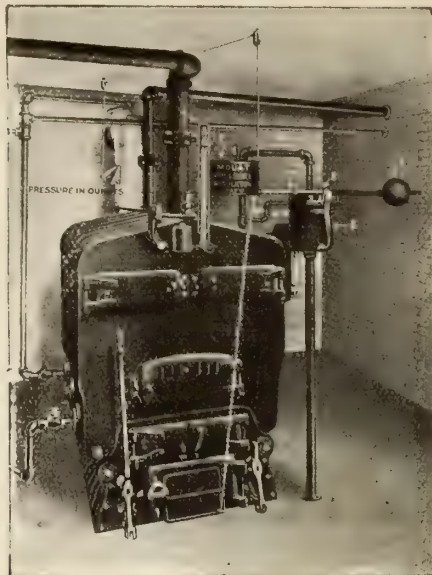
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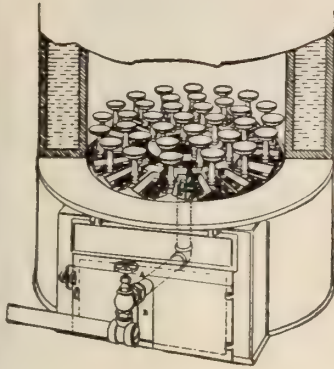
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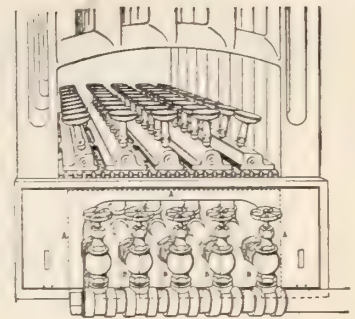
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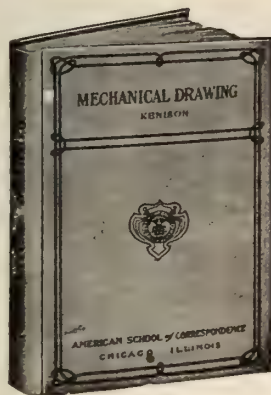
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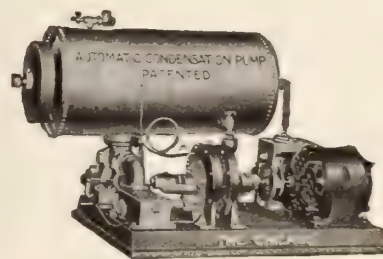
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SANITARY ENGINEER

PLUMBER and STEAMFITTER of CANADA

Official Organ of the Sanitary and Heating Trade

Vol. VIII.

TORONTO, DECEMBER 15, 1913

No. 23

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The MacLean Publishing Co., Limited

JOHN BAYNE MACLEAN, *President*

(ESTABLISHED 1888)

H. T. HUNTER, *General Manager*

SANITARY ENGINEER, PLUMBER and STEAMFITTER of CANADA

J. G. Lorriman, *Manager*

Alex. Wales, *Advertising Representative*

H. M. Reid, *Eastern Manager*

Edwin Newsome, *Editor*

E. G. R. Clarke, Montreal, *Associate Editor*

Published on 1st and 15th of each month. Subscription, Canada, \$1.00; United States, \$1.50; Great Britain and the Colonies, 4s. 6d.; Elsewhere, 6s..

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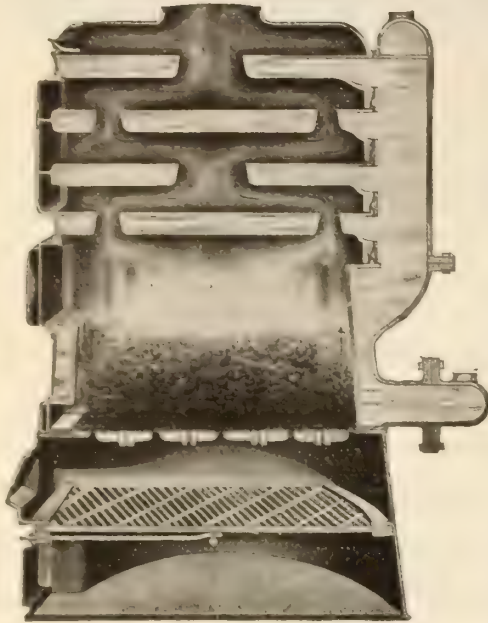
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THE SANITARY ENGINEER

VOL. VIII.

DECEMBER 15, 1913.

No. 24

The Necessity of Profit in Doing Business *

Showing in a Clear Simple Matter the Necessity for More Study
Being Taken by Sanitary and Heating Engineers Who Are at
This Date as a Whole Purely Mechanics and Not Business Men.

We have Biblical authority—if, indeed, we need any—that the laborer is worthy of his hire. No honest business man would dream of carrying on an undertaking which would not enable him to pay each and every one of his employees the stipend agreed upon. The journeyman plumber's wages are figured in the estimate, and even the helper is taken into consideration, but, in many cases, the contractor presents his bid without once taking into account his own remuneration, and treating himself as justly and fairly as he has treated his journeyman and helpers.

It is not that the business man does not want to make out of his business all he is entitled to, but often his training has been technical instead of commercial, and in the light of his limited knowledge of industrial laws and usage, he cannot distinguish himself as an individual from his business enterprise. All money left in the till or in the bank after costs and expenses have been paid are considered profit, whereas in many cases it represents merely a portion of the wages left unpaid, and interest on money overlooked.

For instance, a good journeyman plumber can earn from \$1,000 to \$1,500 per annum. If, now, this journeyman plumber has \$10,000 of savings and earnings, that money can and ought to earn at least 5 per cent. per annum. Five per cent. of \$10,000 is \$500 so that this journeyman's income ought to be from \$1,500 to \$2,000 each year.

Suppose the journeyman were to engage in business, investing his \$10,000 savings. There are three distinct interests then to keep in mind. First, there is the individual; second, the capital, and, third the organized business, and each one of these interests must receive its share out of the earnings of the business.

Let us assume that at the end of the fiscal year, without having paid himself any salary, or allowing interest on the

money, the plumber found a surplus of \$2,000 on hand. Paradoxical as it may seem, he has lost money on his business enterprise, for his combined capital, labor and organized business have brought in only what he would have made with his capital invested somewhere else and had he remained working for some other contractor. All the risks, all the responsibilities, all the worries connected with business he has assumed and borne without one cent of compensation—so what's the use? If an apparent profit of \$2,000 proves in reality a loss, then where does the loss come in?

Simply in losing sight of the fact that having paid interest on the capital invested and to the laborer the hire he is worthy of, together with all other ordinary and extraordinary costs incident to doing business, there should be a real net profit of at least 10 per cent. of the volume of business done during the year.

If the contractor has done \$35,000 worth of business during the year, after allowing \$1,500 or more for salary for himself and \$500 interest on the money invested, there should be a balance of \$3,500 on hand, which represents the real profit made, not on the individual efforts of the contractor, not on the use of the capital, not on a combination of the two, but on that intangible something called the business.

This illustration is carried out in full simply to call attention to the necessity for plumbers to study business conditions with particular reference to the profit they make. Most of the contractors engaged in the plumbing business are expert craftsmen, having spent a lifetime in acquiring their proficiency. At the time they were becoming expert workmen, others following other lines were becoming expert business men, and now expert business men and expert craftsmen meet in the plumbing markets to fight for supremacy. To succeed, the business man must learn much about the practical end of the business, and, conversely, the practical man must learn much about the business end of plumbing.

Unfortunately, there are no schools teaching commerce and business as they should be taught and readily available, where plumbers can go for this special training. When the country is further advanced and vocational training has taken the place of present methods, there will be correspondence courses teaching business in all its branches to men as they work, carried on by the various States. Until that time comes, however, each individual must work out in his own way his own salvation.

The matter of profit in business is important in many ways, and it is profit that makes any business worth while. That being true, the plumbers of a community cannot ignore the way any of their members conduct their business. The actions of one are the actions of all in that one plumber quoting low prices will demoralize prices in that place, in spite of what the others might do, individually, to prevent it. The thing to do, then, is to prevent the cutting of prices. Apply preventive measures in business the same as we do in sanitation, by teaching the merchant plumbers, new and old, how to successfully conduct a business.

Nobody cuts prices because they want to make a small profit in preference to a large one. Something is radically wrong when prices begin to fall, and the thing to do then is find out what is wrong and right it. Lend a helping hand and steady the whole line. Do not treat the price cutter as an enemy, an outcast; he is an unfortunate, striving to do right, ambitious to better his condition and yours. Meet him half way and show him how. Educate him, enlighten him, make a good business man of him and he will never cut prices again. Until the educational authorities make it possible for the plumber to receive the necessary help through the logical channel, each community can do much towards bettering their own conditions and they will be better citizens for their efforts. In every city there are successful business men who are public spirited

(Continued on page 10.)

*From "Modern Sanitation," published by Standard Sanitary Mfg. Co., Pittsburg, Pa.

Construction and Use of Rain Water Leaders

Showing the Need of Good Joints, Abundant Capacity. Their final Terminals Should Also be Thoroughly Considered, According to the Climatic Conditions of the Locality.

By. A. G. Warr, Prince Albert.

In talking on the subject of rain water talking on the subject of rain water leader, I would like to say at the outset that through some misunderstanding as to the subject allotted to me, I have not gone into this matter in the way I would like to have done. However, as mistakes will sometimes occur, and as this matter is down to me for this subject, I will endeavor to introduce it, and at the same time I would ask that you will in discussing this subject, bring any matter forward which appears to you should be embodied in this talk.

The use of the rain water leaders as you all know, is to convey water from the roof to the point of disposal wherever that may be determined. In most cases this of course, is into the sanitary or storm sewer.

Some ordinances object to the disposal of rain water into the sanitary sewer, but for what reason, I am not able to state, unless it be that the extra pressure the sewer is called upon to bear is objected to. Looking at it from another point of view, it appears to me that the extra flushing the sewers would receive would benefit them by thoroughly cleansing them of all effete matter and so render them more pure.

On the ordinary house the disposal of roof water is a comparatively easy task. It is often stored in the basement cistern for household purposes, the overflow being discharged into the floor drain. In some cases the overflow is carried outside and discharged on to the bare ground. Consequently, water finds its way into the basement and causes dampness with its attendant evils. This should not be tolerated for one moment where it can be avoided.

While the small house is comparatively easy to deal with, we have the difficulty which arises in the hearts of our large cities in dealing with the roof areas on the large buildings. The method of dealing with rain water becomes complex and full precautions must be taken to deal with it successfully. In this country, owing to the climatic conditions and also to the way in which roofs are constructed, and in order also to be able to connect with the inside drainage, it is necessary to carry the rain leaders through the inside of the buildings. In view of this, great care must be taken in the way in which it is carried out and proper material must be used.

It is just as necessary to use every care in the construction of the rain water leader, as it is in the construction of the ordinary stack pipe. I fear in too many cases it is treated too lightly and looked upon as being only the rain water leader, but its work is very important and its location in the premises will certainly give rise to great danger where sufficient care is not used in its installation.

All rain leaders should be constructed preferably of cast iron. Other material may be used such as steel, but cast iron is most commonly used and equal to anything that can be got for the purpose. In cases where leaders are carried through many storeys, as is the case in very high buildings, the strain to which they are subjected at times is of a very severe character.

Imagine a column of water descending through several stories and the consequent strain upon the system. This often happens in cases of severe thunder storms during the summer. A tremendous volume of water is being poured through in a very short time.

As I have pointed out, the strain is very severe at times, which the work of the leader is called upon to perform. The necessity arises for the greatest care in jointing and also in the use of sound material. It has been customary to trap the rain leader before entering the main drainage in order to prevent its use as a vent stack but it is an open question if any great evil would arise if this trap were abolished altogether. We so constantly have to change our view point on different matters, what is considered good practice to-day may through increased knowledge be condemned in the future. If the trap be installed, during spells of hot weather it is liable to lose its seal through evaporation, and thus become useless. It also to some extent retards the free flow of water. A special point to notice as I pointed out before, is that as much care should be bestowed on the rain water stack as on the newer stack in its method of construction.

The connection at the roof should be made gas tight by heavy lead or copper drawn tubing wiped or soldered to a brass ferrule or nipple caulked or screwed into a pipe.

Sufficient leaders should be provided to take the area to be drained, these might be branched into one delivery pipe or sufficient capacity to take the number of leaders provided where this

could be done without increasing the size of the pipe beyond the size of the main drainage.



DEALS WITH ABATTOIRS.

"I cannot understand Dr. Hastings' explanation of the stream of blood that flowed through High Park Sunday," said a west ender to The Telegram. "He says it was 'the result of an accident to sewer pipes.' I would like the doctor to explain the presence of the blood and offal in the sewer. The city by-law No. 4,329 is explicit on that point. It reads:

No blood, offal or any other refuse of any nature or kind shall be permitted to pass or escape into the public sewers or into any stream or watercourse.

A penalty of \$20 and costs for infractions is provided.

"The abattoirs have been using Toronto's sewers as a quick disposal of blood and offal. Dr. Hastings proved this to his satisfaction some weeks ago.



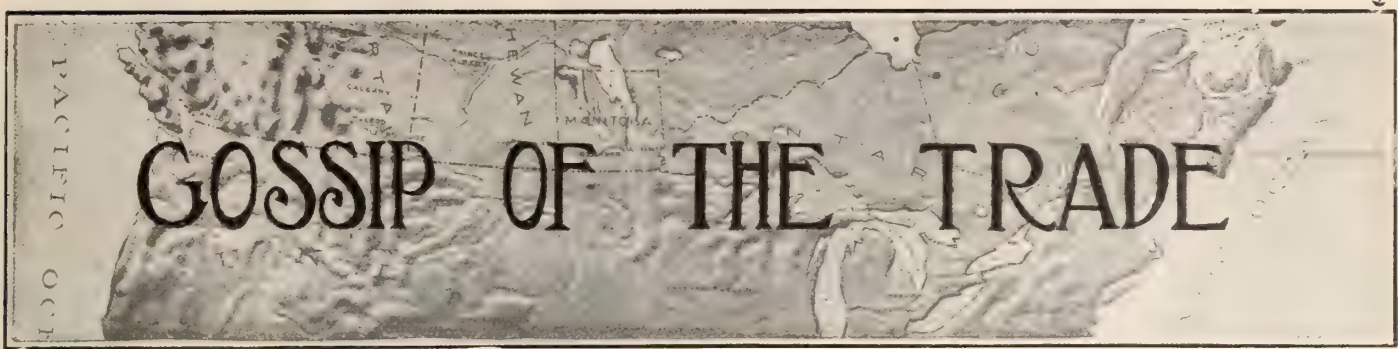
PROFIT IN DOING BUSINESS.

(Continued from page 9.)

citizens, willing, able, and glad to help others. At no expense whatever, a series of talks could be arranged to be held in the rooms of the association. In the large cities the jobbers would lend their aid to the movement, while in the smaller cities the scope could be broadened to take in merchants in other lines of business.

There are bankers a-plenty who would be glad to talk on banking, interest, discount, notes, loans, deposits, collections and various other banking subjects vital to the business man. The railroads would gladly send a representative to make simple many of the mysteries of transportation, delays, claims, losses, breakage, rates and many other subjects. Lectures on salesmanship, advertising, display, buying, insurance and the thousand and one branches making up modern complex business methods could be arranged, and there is no questioning the fact that every one attending the series of lectures would be bigger, broader, better and more successful business men after the season was over.

Nobody helps us in business if we do not help ourselves. If the plumbers start a movement such as outlined above, they will not only help themselves, but will gain a wealth of help from others.



GOSSIP OF THE TRADE

PROMPTNESS APPRECIATED.

St. Thomas.—Messrs. Hamilton & Stotts suffered loss by fire recently, which would have been more serious had it not been for the timely warning of Charles Corbett, the worthy post office distributing clerk. The firm sent Corbett a "fiver" for his promptness.

Stratford, Ont.—The citizens have voted against the city guaranteeing the bonds of the Avon Hosiery Co., and against purchasing additional fire apparatus.

Medicine Hat, Alta.—The city will submit by-laws authorizing the expenditure of the following sums: \$175,000 on a waterworks system; \$60,000 on storm sewers; \$12,000 on additional fire apparatus; \$50,000 for repairs to roads and purchase of road construction plant and machinery; \$150,000 for increasing and extending electric light; and \$50,000 for drilling gas wells.

HISTORY DOES NOT ALWAYS REPEAT ITSELF.

Kerrisdale, B.C.—The tragic story of Cain & Abel is reversed at Strathecona Heights, Vancouver, B.C., and instead of an antagonism between the two Cain & Abel are now engaged in a pleasant business relationship.

Mr. Cain is the owner of some property in perhaps one of the most beautiful spots in the world a veritable garden of Eden and has accepted a contract for the erection of his residence from Mr. Abel. The plans and specifications have been prepared by Mr. Thomas Hooper, architect, of Vancouver.

To add to the lasting comfort of this domicile The Kerrisdale Plumbing Co., whose reputation for plumbing and heating is so well known have been specially engaged.

GAS FATALITIES CAUSING CONCERN.

M.O.H. Working on Special By-law Governing Gas Piping and Fixtures.

The frequent deaths from gas poisoning have given cause for apprehension on the part of the civic authorities, with

the result that Dr. Hastings, Medical Officer of Health, has a special by-law under preparation governing the periodic inspection of household gas pipes and fixtures. This was the announcement made by Civic Inspector Meadows at Coroner Morgan's inquest into the double asphyxiation of Archibald and Neil Macfarland at 165 Duchess Street recently.

The inspector also intimated that the Health Department will also recommend that a safety appliance be attached to all domestic fixtures.

Atop of these statements, the jury after hearing the evidence added a rider to its verdict of accidental death by gas poisoning, that "the civic authorities should investigate the question of safety appliances, and recommend something that will prevent deaths from gas poisoning, unless deliberately accomplished."

The jury further recommended that an officer should be placed in charge of a room in which a death under these circumstances has taken place, until the Coroner has had a chance to make an inspection. A third recommendation was to the effect that domestic services should be subject to periodic inspections.

Coroner A. E. Morgan sought the advice of Mr. Skirrow, of the Consumers' Gas Company, and Inspector Meadows, of the Civic Health Department. Mr. Meadows declared that it was imperative that inspections should be made, while the company's inspector declared that suitable safety appliances were already on the market. Mr. Skirrow had inspected the fixture through which the gas escaped causing the deaths under investigation, and found it in good condition.

WANT NEW LECTURER.

Moose Jaw.—The technical education committee is advertising for a qualified and experienced lecturer on plumbing and sanitation. James Woodhall, the instructor in that subject, having been transferred at short notice to Moose Jaw. Mr. Woodhall is a superintendent of construction and has been a most efficient instructor in the evening classes. Temporary help has been obtained

through the courtesy of Mr. Fletcher, plumbing inspector, and James Marr, senior, who took the classes this week. The committee hopes to be able to secure a permanent instructor immediately.

CANADIAN INSTITUTE OF SANITARY ENGINEERS.

Winnipeg.—A meeting of the Winnipeg and St. Boniface members of this institute was held in the Winnipeg Industrial Bureau on the 21st Nov., which was favored with a full attendance. Mr. Jas. Smith, president, occupied the chair.

The main purpose of the meeting was to inaugurate a series of meetings throughout the winter months of 1913-14 to deal with certain measures which were left over for further consideration from the convention held last April, namely, Examination of plumbers, pipe terminals, rain water leaders and standardization of fittings and soil waste and vent pipes.

Sub-committees were appointed to give their special attention to the different subjects, and it was decided to hold monthly meetings when the prescribed subjects will come under discussion.

LARGER QUARTERS.

The Toronto branch of the Canadian H. W. Johns-Manville Co., Limited, announces its removal to more spacious quarters at No. 19 Front Street, East. This new store and ware house has a floor area of approximately 35,000 sq. ft., and is situated in the heart of the whole district.

In their new quarters this firm will be able to carry a larger stock and have ample space for the display of their complete line of J-M Asbestos roofings, packings, pipe coverings, building materials, electrical and railroad supplies, automobile and plumbing specialties, etc.

The entire building will be lighted by their well-known Frink and J-M Lino-lite System of Lighting and one room will be used for exhibiting these systems of lighting.

NEW PREMISES.

Messrs Birnie Bros., Medicine Hat, have recently opened what is claimed to be one of the most up-to-date hardware stores in Canada. They will also carry on the business of sanitary and heating engineers and sheet metal workers. Leslie J. and Edwin R. Birnie are the proprietors, and along with an able staff will endeavor to give the very highest service to the public it is possible to do.

This splendid building known as the Birnie block has a floor area of 25,000 feet and will be under the management of L. J. Birnie, with O. C. Flood, chief accountant; T. Elder, is the buyer; Nat. Conners, will have charge of the sanitary and heating department; E. L. Cope takes charge of the tinsmith and sheet metal work. Their total staff will number 53.

This must be a very creditable enterprise to the city of Medicine Hat.



W. R. PICKUP & CO., LTD., OF HORWICK, LANCASHIRE, ENGLAND.

The above firm have issued a beautifully gotten up catalogue of over 200 pages. This company is the successor to Messrs. G. & D. Musgrave, Ltd., and manufacture high grade enamelled fire-clay sanitary ware and fittings. It shows all their newest lines to the very best advantage and would be a useful addition to the list of catalogues which all up-to-date sanitary engineers must have. This catalogue would be particularly interesting to the Old Country man who is engaged in the business, and we have no doubt, those who wish to acquire one can do so by writing to Messrs. W. R. Pickup & Co., Limited, Pearl Brook Works, Horwick, Lanc., England.



REACHED PINNACLE OF RED TAPE Much Trouble in French Sanitary Department Over 28-cent Plug.

A remarkable story of what official red tape can accomplish comes from a seaport in Brittany.

It appears that the Sanitary Department had an old plug for stopping up pipes which had become useless through age. The chief of the department accordingly applied to the Minister through the official channels for permission to incur the necessary expense to replace the plug.

The Minister, after long reflection, asked if the plug really could not be used a little more, and three witnesses had to certify in writing that it could not.

Finally the Minister notified the department, still through the official channels, with all the usual delays, that a new plug might be bought.

Then the question of what to do with the old one arose. The chief of the department, through the official channels, asked if he might give it to the port authorities to be sold for the benefit of the fishermen.

After thinking it over the Minister said it could be done, but the port authorities refused the present on the ground that it was not worth the cost of accepting it.

It was then necessary to inform the Minister by an official memorandum, signed by the two chiefs, of the refusal, and to ask permission to burn the old plug.

But the Minister's idea of economy revolted against the sacrifice. Couldn't it be used for something else? he asked—through the official channels.

Two experts were then engaged to certify that the unhappy stopper was good for nothing at all. Only then did the Minister authorize the destruction of the implement, on condition that the chief sent an official certificate of its destruction. This was done.

It might be added that when it was new the stopper was worth 28 cents.—London News and Leader.



EDUCATION AN INVESTMENT.

We have just received a very interesting booklet entitled Education and Investment, issued by the Anglo-American Sanitary Correspondence School, Ontario St., Chicago. This book is not only interesting but contains some very useful information which all sanitary and heating engineers should know. It is free and can be procured by writing to the above address.



LETTERS OF APPRECIATION.

Likes Sanitary Engineer.

"It is with pleasure I am forwarding you order in payment of subscription to The Sanitary Engineer. I like it fine. I take great interest in the questions and answers. Yours sincerely,

C. McINTYRE.

Don't Use a Pipe Wrench on Nickel-Plated Fittings.

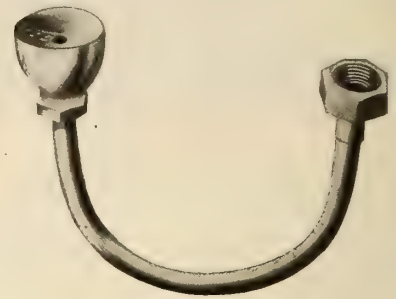
There is certainly a lot of missionary work to be done by the manufacturers as well as such mediums as yours, and we wish to compliment you very much on the stand you are taking as it means the elevation of the plumbing profession to a much higher scale and we will certainly do our part in requesting users of our goods to refrain from using such tools. We believe that by the proper co-operation of the publishers and the manufacturers we will be able to do much. Yours very truly,

H. Mueller Mfg. Co., Ltd.

Sarnia, Ont.

EMPIRE BRASS MANUFACTURING NEW FOUNTAIN.

In a recent issue we erred somewhat by placing a cut of new fountain upside down. This fountain, which has some very novel features embodied in it, is being manufactured by The Empire Brass Manufacturing Co., Ltd., London,

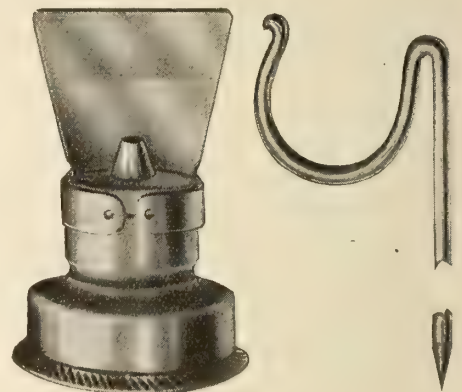


Ontario. They have several novel claims, some are its simplicity of construction its durability and is easily attached to any ordinary hose bibb cock. Further particulars may be had by dropping a post card to The Empire Brass Manufacturing Co., Ltd., London, Ontario.



DUO HOSE NOZZLE.

The Duo nozzle here illustrated is being offered to the Canadian hardware trade by the H. B. Sherman Mfg. Co., of Battle Creek, Mich.



Duo Nozzle.

The Duo nozzle is a combination hose nozzle and lawn sprinkler. The new nozzle has no shut off. It is claimed by the manufacturers that it accomplishes all requisite results as it throws both a straight stream and spray without the necessity of a shut-off and the danger of hose bursting caused by the sudden turning off of water is said to be eliminated.

One of the most important features claimed for this nozzle is that it delivers a large volume of water whether used as a straight stream or as a spray. In the Duo nozzle the spraying feature is produced after the water issues from the nozzle, hence the volume is not cut down by internal mechanism. The nozzle portion is made of wrought brass finished both inside and out.

Sketches From An Inspector's Note Book

A Series of Articles Will Appear from Time to Time, Submitted by Men Who Are Holding Position of Inspectors. The Subject Will Be Treated Editorially.

Series 2.

In our last issue we published the first of a series of these sketches, which as we stated before are being submitted from men in different parts of Canada.

In figure 1 we have shown portion of a stack, which, in the first place has no provisions made to clean out the horizontal flue of the house drain, and second, the horizontal line is so very uneven that there is a trap formed at a very bad portion of the system. We cannot in this instance feel that the person who did

we have known such to have happened, and is happening every day, but why? Simply because the mechanic who has installed the work has not used a little grey matter (common sense).

For instance, almost 9 out of 10 jobs, you will find the hangers put close to the underside of the hub and then, of course, if the building should settle it pulls down the soil pipe slack with it. Then, again, no foundation was placed at the foot of this slack to prevent it from settling.

$\frac{3}{4}$ Black Iron for Waste Pipe.

Fig. 2 shows a job which is out of all reason and only goes to show our city authorities of this Canada of ours, that periodical inspection of sanitary work should be the order of the day. Here is a direct act where the lives of the occupants are being endangered. Anyone found installing such a job should be arrested and placed in the common gaol without the option of a fine.

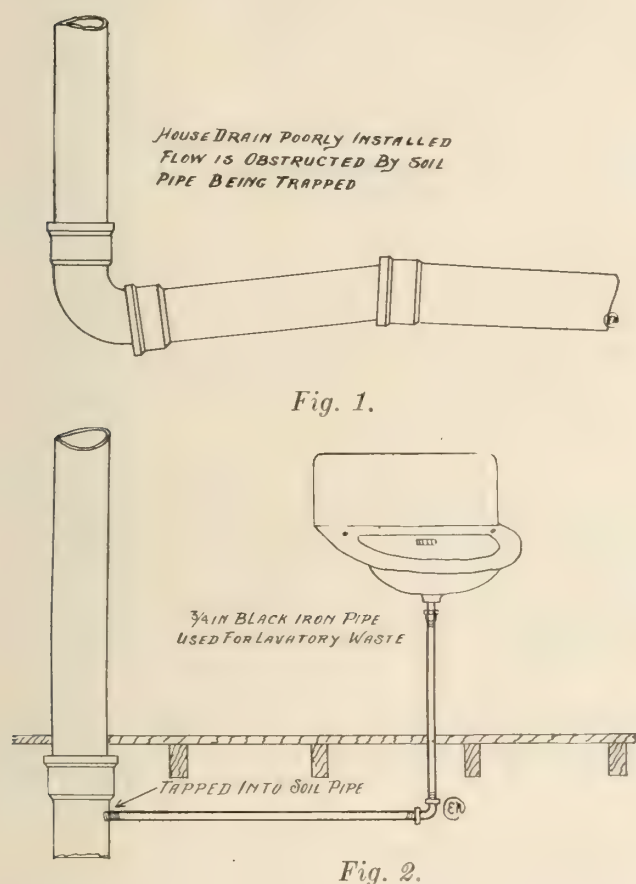


Fig. 1.

Fig. 2.

this work really intended to have the line trapped in that way. It is a case of down-right poor workmanship, and no man should be allowed to practice in the trade who would prove his inefficiency to such an extent as to leave work in this way.

Possibly It Settled.

Some of our readers may state, that they have seen similar conditions caused by a building settling, drawing the screws at the hangers. However, in this instance, such was not the case, though

This trouble of settling can be easily remedied. There is no reason in the world why it could not be. If the hangers are a little below the shoulder of the hub, then any heaving of the building would be overcome; again providing that a good foundation is built at the foot of each stack. In the city of Ottawa there is a clause in the by-law which insists that a concrete base, or stone, be placed in that position, and, while simple in itself, speaks volumes, and results in no such conditions as pictured in Fig. 1.

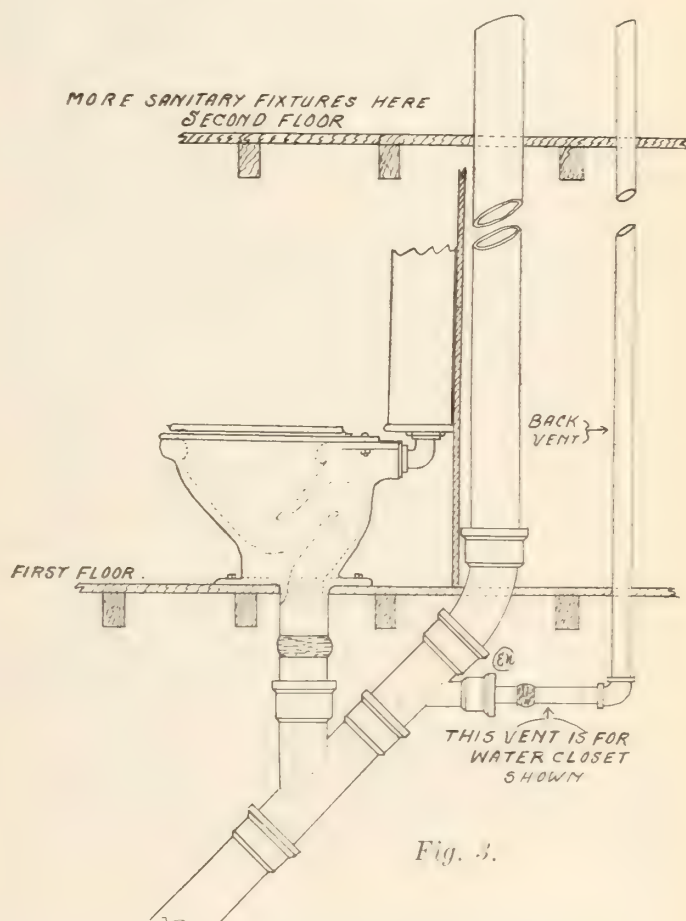


Fig. 3.

If one was to break the civil laws of the land, he would be given no mercy by pleading ignorance of the law. Such a plea bears no weight in our courts. Hence, why should such work be permitted under our very nose, simply because of not having periodical inspections and then found out by purely accidental calls.

Fig. 3, we are told was a job installed where evidently the mechanic was trying to conform to some of the laws of which are embodied in good sanitary engineering. But, here again, we see a lack of practical experience.

The Sanitary Engineer

Plumber and Steamfitter of Canada

Published on the 1st and 15th of each month by

THE MACLEAN PUBLISHING COMPANY, LIMITED

Subscription, Canada, \$1.00 per year. United States, \$1.50; Great Britain and Colonies, 4s 6d; Elsewhere, 6s.

CABLE ADDRESS: Macpubco, Toronto. Atabek, London, Eng.

John Bayne MacLean, - *President*

J. G. Lorrimer, - - - *Manager*

Edwin Newsome, - - - *Editor*

Circulating amongst Sanitary, Heating and Ventilating Engineers, Gas Fitters, Sanitary Inspectors, City Engineers, Boards of Health Architects, etc.

TORONTO, DECEMBER 15, 1913

XMAS GREETINGS.

Let's look back Old Friends just for a minute. Old Father Time ain't been so bad after all, though to the superstitious the year 19—13 has had a little of the Hoo-doo mixed with it. Finance has been a little tight and all other things have happened which depends upon the free flow of money, however we're still here in the land of the living and if reports are true their has been a less number called to the Happy Hunting Grounds this year than ever. This state can be traced directly to the facts that better sanitary measures have been and are being adopted all along the line. 80 per cent. of our deaths are shown to be the results of unsanitary conditions and we as sanitary engineers are engaged in removing those conditions. So this has not been much of an Hoo-doo year after all. Hence we wish you all A MERRY CHRISTMAS AND A HAPPY NEW YEAR.

WE MAKE THE HOO-DOO.

Time has done much to clear the air of old superstitions. Inventors have been prompted to create new machinery, scientists have done lots to clear the air of the bogey, and all these things bring us face to face with facts. One or two old fogeys said, "Of course 1913 had to be a Hoo-doo year." We knew it would be. It's just like this, 13 is the unlucky number, etc., etc. Now to treat this rot properly would be to say skidoo 23 and smile.

THE REAL FACTS.

This is a new country, the people have been a little too reckless in speculation, the real estate boomer has had too ready an ear. We have plunged a little too far into things which needed time to develop, before we could receive returns. We have taken currency away from industrial enterprises, and put it into land. The only thing which land really gives to us is crops. Crops require time to develop. We cannot hurry them on, hence we must wait. The present tightness of money was the direct results of our own management, and, nature called a halt. She won't be hustled, and we've heard her say so this year, 1913, and if we have heard her voice clearly and heeded her warning, the year 1913 has been a lucky year.

We will soon get over it, but, had she not spoken at this time, we would not have recovered so easily, Hence we may say with all heartiness, "Skidoo 23."



EDITORIAL COMMENTS.

Wanamaker's salary was \$1.50 a week.

* * *

Jay Gould canvassed Delaware County, New York, selling maps at \$1.50 each.

* * *

Benjamin Franklin was not a millionaire, yet he founded the Saturday Evening Post.

* * *

In the old days rival competitors in business cut each other's throats. They then began to cut their own throats by the much regretted method of price-cutting. Then they would cut each other's acquaintance and ignore one another on the street. Now, live up-to-date business men are beginning to co-operate, at one time competition was spoken of as the life of trade, but now co-operation is the very extract of life in business.

* * *

When business begins to interfere with pleasure, "Cut out the business," simply because if your business is not a pleasure it must eventually culminate into a failure.

Hence if business is an apparent losing game, it can't be a pleasure, so cut it out. The days are past and gone when men with clear visions and practical insight look upon their business as a drag on them, as a something which is running them instead of them running the business. Therefore, make your business a pleasure, make it profitable. These two commodities alone will put new life and interest into your business. No man should feel that he is getting relieved when he closes his place of business. He should rather feel that he has made good another day and that he retires to gain strength for another day.

The Business Situation

IT has been said that the only reason for panics and periodic depressions is a purely psychological one. Doubts are bound to arise in the mind, first resulting in a greater degree of caution in certain circles, which in time leads to retrenchment. Drawing in of lines in some industries forces others to adopt similar measures. Talk arises, the retrenchment becomes general; and a depression is the inevitable outcome. This lasts until the normal condition of business reasserts itself, when the depression vanishes like night mists before the rising sun.

It would be sheer blindness and fatuity to contend that the condition of business in Canada at the present time is entirely satisfactory. Money has been tight all year and is still none too plentiful. In some towns the volume of business has not shown the normal increase, while in others there has been practically no depression, but rather an increase. Several towns of 10,000 to 30,000 population have actually done more business in the sanitary and heating line, and one of the largest boiler and radiator manufacturers have had an increase in their business this year over any other year previously. The outlook for the new year is good. There is no room for pessimism in Canada to-day.

The only thing that could keep the country from throwing off the fetters of hampering conditions at once would be the continuance of a certain pessimistic note

that has crept in. There is too much proneness when men get together to discuss the rumor that a certain factory has closed down, to talk over the estimate of some gloomy statistician that so many thousand men will be out of work during the winter, and so on. Too many men have fallen into the habit of shaking their heads and blindly accepting worthless opinions and ill-founded information. Unless this attitude maintains a spirit of retrenchment beyond the time when retrenchment is necessary or advisable, the New Year should start out with every prospect of a complete return to nation-wide prosperity.

There is every reason to look for a betterment of conditions. The crop was an exceptionally good one and the agricultural classes should have plenty of money to spend. The influx of immigration during the past year has been heavy. Financial conditions have been improved by the complete or partial settlement of the events which brought about the tightness of the past year. The Balkan situation has simmered out, U. S. business men have practically recovered from their fear of the effects of the tariff reductions, the Mexican situation does not seem as likely to lead to complications. Causes of friction and uncertainty seem to be smoothing out.

It must not be expected, however, that the improvement will come immediately. It will be gradual and care should be exercised to prevent the slowness of the change from leading to continued uncertainty and pessimism. A cheerful and confident outlook is an asset that all Canadian business men should acquire at once.

Canadian Domestic Sanitary and Heating Engineers Begin Their Meetings, Etc.

Toronto Branch Hold Their Annual At Home, and Saskatoon Branch Hold Their Annual Meeting.

TORONTO.

A splendid programme was prepared which passed off without a hitch and was as follows:

Progressive Euchre.
Carpet Ball.

The winners at the euchre tables were: ladies' high score, Mrs. Yeoman; ladies' lone hand, Mrs. Aggett; ladies' consolation, Mrs. Kirtley.

Gentlemen's high score, Wm. Mansell; gentlemen's lone hand, Mr. Blumbergh; gentlemen's consolation, Jas. Aggett.

The results of the carpet ball game were of such a startling nature that space will not permit. It might be mentioned, though, that one of the men in charge of the hall was seen doing some repairs to the floor and some of the tools he used were a pipe wrench, pliers, hammer and screw driver. "Nuf Sed" for the ball game.

Music came next and the following

selections were admirably rendered:

Solo, "Roses in June," by E. German, Mrs. Passmore.

Encore, Selection from "Firefly."

Solo: "If I were a Rose" by Hesselburg, Miss Fullerton.

Encore, "Good Night, Little Girl" by Macy, Miss Fullerton.

Solo and encore, "Queen of the Earth," Mrs. Woodcock.

E. Jules Brazil, 41 Gormley Ave, followed with a sketch on Yankee Doodle followed by a Musical Monologue about two Toronto Newsboys.

Refreshments were then indulged in by all, which was followed by a dance.

SASKATOON.

Sanitary Engineers Hold Their Annual Meeting.

At the annual meeting of the Saska-

toon society of Sanitary and Heating engineers, held on Thursday, in the builders' exchange rooms, the following officers were elected for the ensuing year:

President, Neil Beaton (re-elected); vice-president, G. Edgar Knechtel; secretary-treasurer, M. R. Pout (re-elected); executive committee, James Brandon, A. Brown, Jos. V. Brady and the above named officers; legislative committee, James Brandon, A. Brown, Jos. V. Brady; entertainment committee, C. A. Green, H. L. Parnell, D. G. Saunders, and secretary M. R. Pout.

The annual banquet will be held on January 8. The monthly dinner will be held on the first Thursday of each month after January, and the regular meeting the second and fourth Thursday of each month until further notice.

First Class Quality or Price, Which?

Showing That Economy in Buying is Buying the Best—Advocating That All Goods Bear the Manufacturer's Name as a Guarantee of Good Faith—First Cost Being Last When First-class Goods Are Purchased.

By C. W. Wagonseller, Decatur, Ill.

A paper which was read and discussed at a gathering of big buyers. It met with almost unanimous approval as representing the growing conviction that quality not price is entitled to first consideration, a paper worth your reading.

It is rare judgment that can properly differentiate between the good and bad and accurately determine when an article is cheap at the price asked. In other words, it's a wise man who can tell when he has a bargain.

A bargain has been defined as a transaction in which both sides are satisfied; a trade in which both sides are benefited.

But men disagree on this question, according to their understanding of the word "bargain."

One man will buy a certain thing because it offers a lot for his money, regardless of the service it will render, and think he has a bargain.

Another man will pay a lot more for a whole lot less goods because he is buying for service, quality, dependableness, and not bulk. He knows he has a real bargain. He sees the wisdom of paying a fair price for goods that will last long and give satisfactory service rather than to buy at a low price the kind that will last but a short time, give poor service and cause dissatisfaction.

It is True Economy.

There are still many who believe it is economy to buy cheap plumbing goods. But their number is growing less. Most buyers now realize that a dollar in value calls for a dollar in money and that it is true economy to buy that kind—the kind that has genuine quality and lasts, and does not require frequent repairing.

Plumbing goods that have nothing but a low price to commend them will not return adequate service and must soon be repaired or replaced. To the original low price must then be added the additional labor, the annoyance to the consumer and the loss of his good will. In the end the low-priced goods have become high-priced.

If you buy this class of goods simply because they are cheap in price, you will awaken to a realization of the mistaken policy when they begin to call for repairs and replacing. You will then have the repair bill to pay, or as is frequently the case, be forced to buy goods of real

quality in order to secure the service you want.

Cost is the Same.

It is certainly plain to all that it costs just as much to install cheap goods for any service as it does to install good ones, but there the similarity ends. With the installation of quality goods, the expense is practically over. With the installation of inferior goods the expense has just begun.

It is far better to pay a better price for a better article—one that will give good service and not require constant repairing and changing. We should never lose sight of the fact that thoroughly satisfying a customer creates good will, and good will is a most important asset in the establishment of a permanent and profitable business.

First Consideration.

A consumer should understand that quality is the first consideration in plumbing goods. A man who wants a good saw does not go to a ten-cent store to get it. He wants one of good metal with a reputable maker's name back of it, because he wants a saw that will last. He will buy of a dealer who will give him an assurance of quality. He should do the same thing with plumbing goods. He should know that cheap plumbing brass goods are not capable of giving any better service than a ten-cent saw. It's easy to understand that a dependable saw can't be classed with the ten-cent variety, and it's just as easy to understand that high quality plumbing goods can't be classed with the cheap varieties.

It can truthfully be said of goods of quality and undeniable merit, even though they cost more, that they possess better material and better workmanship, which enable the workmen in an enlarged degree to do better work in the fitting. They require less attention for repairs, are certain to give good and reliable services and consequently remove at once a cause for future complaint.

Is it not true of your watch, your horse, your auto, in fact anything, that you forget the original price if long and reliable service is returned at small up-keep. In the end you say you surely had a bargain.

Name on Goods.

The manufacturer knows just how much it costs to make an article of

quality, and knows it must be sold at a certain profit to keep up to that quality.

He knows also that the same article cannot be made just as good by a competitor using inferior material, cheap labor, and cheaper methods. As a rule buyers are coming to the point where they place a higher estimate on quality and a lower estimate on price. They are realizing the false economy of being influenced by price and the true economy of being influenced by quality, value and serviceability. Manufacturers who believe in the quality theory are today putting their names on goods and standing back of them. This is true in nearly every line of business.

In watches, clothing, shoes, furniture, the name of the maker becomes the guarantee to the buyer. He stands back of the retailer and brings himself right up to the consumer with the assurance that the goods are up to the representations of his salesmen or his advertisements.

Use Only the Best.

It seems to use the part of shrewd business to use only the best there is when it comes to the installation of plumbing. And it seems to us that it would be the part of good business judgment to use only such goods as are guaranteed and backed by the name of the manufacturer on the same. If these goods fail to return reasonable service for the price charged, the source of their manufacture is easily traced by the name which appears thereon. It affords a chance for just complaint or friendly suggestion. Neither of these is offensive to the manufacturer—on the contrary, both are welcome. A just complaint is easily remedied and a suggestion for overcoming some defect developed by local conditions, affords the opportunity for correction, frequently the opportunity for an improvement in the goods.



NEW WATER MAINS.

New Liskeard is to be complimented by having the mains for their new water supply pushed along so ably during the severe weather which they are having. It takes grit to grapple with such undertakings under the same conditions.

A Christmas Chat to the Old-Country Man



OW many of you have laid in your bed and listened for the old church bells to ring in the Christmas morn?

How many of you have heard a rustle in the air? Then, in the twinkling of an eye you have heard that old tune "Yorkshire" to the old, old words: "Christians Awake, Salute the Happy Morn." Say boys! doesn't it take you back to old times, old scenes, old faces, some of which are now passed on? How many of you were in that bunch of Carol Singers who, for weeks would be practicing those old tunes, which seemed ever-welcome to one and all? Hush, can't you hear them still, we know you can.

Then listen for a minute to the old tune (Winchester) and the words:

"While shepherds watch their flocks by night
All seated on the ground,
The Angel of the Lord came down
And glory shone around.

Another minute. Listen to the mummy-faced children, mostly girls, and belonging to your neighbors, with their wessel basket of toys and mistletoe, singing:

Here we come a wesselling
Among the leaves so green:
And here we are as wanderers as fair as to be seen.
Love and joy come to you and to our wessel too.

Then the lads would pay you a visit and with lusty voices, then you'd hear a rap at the door, followed by:

"We wish you a Merry Christmas and a Happy New Year,
A pocket full of money and a house full of cheer;
A great fat pig to kill next year, "Please will you let us in?"

But, readers, we've been looking back a bit. Now let's look forward. Here we are in this fair land of promise. This Canada of ours which has given us, one and all, new life, new thoughts, new aspirations, and last, but not least, a brighter outlook and brighter visions.

This Canada of ours is the new picture we must look upon from now on. We like to look at old pictures just as we like to think of old times. But the New is ours, it is ours for our children. Old memories have cost us too much, and with all due respect to the past, we do not want our children to pay the price which we have had to pay. Hence, let's look forward to the new pictures, to the new country we have adopted, to the new land of promise, which is to be the fair land of Canaan to our children. So look forward, and while taking the best this country can give, don't forget to give the best. "It's more blessed to give," and again we'll say

A Merry Christmas

"Shop Economics," a Talk With Boss, Journeyman and Helper

Showing Where Savings Could be Made, Where the Boss Would Save, Journeyman Earn and Helper Learn by Using the Methods at the Right Time.

In these days when earning a living seems to be the vital calling of the human race, especially those engaged in the business of sanitary and heating engineers, we are apt to blame a thousand and one things as the cause, for the lack of success in this line of business, we bemoan our lot and repeat the cry that the high cost of living is the only cause. Then we turn round and plead that price cutting has a little to do with it, etc., etc. We still keep on in the same plaintive strain and say "Oh yes, I employ 15 to 20 men as well as their helpers and after I've paid their wages the wife gets the rest." She chips in here and says, "Yes, Yes. She does get the rest till Monday and then you want to put an extra \$10.00 into the bank to have a decent balance after So and So's draft is paid." And there the story goes. Yet we are all forgetting that old saying of the old Jew who's son went to New York to get a job. This son of Abraham, getting tired of home ties and the apron string, went off to New York to get a job. Got the job, and did fairly well, wrote five letters to his Dad, and finally after being away from home a year or so, decided to pay a visit to his home. He had been earning a good salary, was well dressed, clean, tidy and in all looked like a transformed being in comparison to his make-up when he left home. Well after much merriment had been indulged in, his father took him to one side and said: "Vell, Isaac My Zon. I vos so bleased to hear vat you been zay to you Vadder. Vat I vud like to know is 'how mush cash vas yoa have in da bank.'"

Well, Isaac looked kind of blue and said, "Vell Vadder, you know vat I vas dressed like ven I lef here and you see how I am dress now, doan you Vadder dear, den besides you know in New York it cost more to live, etc., etc." In fact Isaac had been having a good time and didn't have a red cent to his name. So his father replied. "Isaac, my Zon, I been bleased to hear you earn big money and all dat but My Zon! My Zon! I doan vant you to go boor all der ob yer life, and if yer go back to New York, just take this bit of advice off yoa Vadder. It's not the money you earn vat makes you rich. It's vat you save, My Zon."

For instance, Sanitary Engineers have

about as many ways of saving as most other trades, if not more. Not long ago one of the craft got the work of putting new fixtures in a house which was being re-modelled. At the rear of the old portion a new bedroom bathroom and kitchen was being added. The wall which the sink in the kitchen, and lavatory in the bath room had to be fastened to was outside wall and it was decided to leave it in, so of course these fixtures were to be fastened to the brick wall, "and they were." But a few weeks after they had been in use.

swear better than wood. The writer fastened pump and machines weighing as much as 250 lbs. on a wall by using a piece of 3-8 lead pipe and coach screws, over twenty years ago. That's a kink and one which saves. The sanitary engineer mentioned, who put those fixtures in probably made twenty-five dollars but lost fully \$10.00 and a reputation plus a good customer worth untold wealth. Hence "its not what you can earn that makes you rich it's what you save." The boss who supplies his men with



"It's not vat you earn vat makes yer, it's what yer zave, my zon."

They Began to Give Way.

Early one morning this sanitary engineer had a call. The sink had fallen down and had it not been that the water pipes were lead, there would have been more trouble, because iron pipes would have broken at the threads. Now here was a job where money was lost and where it could have been saved. How you may ask? Well, by using the proper thing in the right place. There are several kinds of expansion bolts which can be relied upon for such work, yet, one may venture to say that, few are used by sanitary engineers. Every one knows that wood plugs dry up and get lose. That is a drill is brought into play to bore the holes in either brick, cement or stone, then even a lead plug would an-

proper tools and expansion bolts (which can be bought in various sizes) would be helping the man to earn more money, and the lad who saw such a method put into practice would never put up a heavy fixture on such a wall with wood plug.



The Crown Die & Tool Co. New Tool Booklet.

The above company have recently issued a new booklet and catalogue which illustrates their Crown Dies and other pipe threading and cutting devices. In this booklet will be seen a very novel style of vise. Those of our readers wishing for one may procure one by writing The Crown Die & Tool Co., 105-109 North Canal St., Chicago.

NEW CANADIAN PATENTS

John Robert Carter, Toronto, Ontario, Canada, 1st July, 1913; 6 years. Filed 28th November, 1912. Receipt No. 217,409.

Claim.—1. In a heating device for baths, the combination with a bath having hot and cold water supply pipes and a waste pipe, of a circulating pipe extending around the bath and terminating in an inlet, branch pipe connecting said circulating pipe with said hot and cold water supply pipe, pipes connecting said circulating pipe with said waste pipe, valves for regulating the flow and temperature of the water through the circulating pipe, and means for directing such

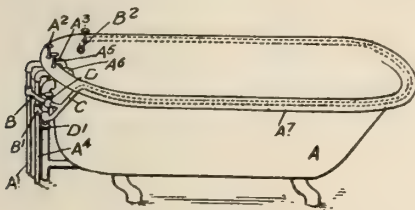
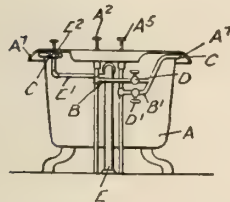


FIG. 1



149003 FIG. 2.

No. 149,003. Heater for Baths.

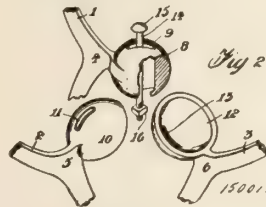
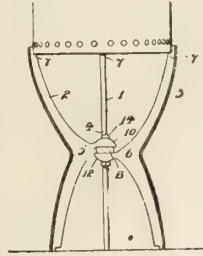
flow into the bath or to said waste pipe, as and for the purpose specified.

2. In a heating device for baths and the like, the combination with the bath having a suitable inlet opening, of a water supply device, of a pipe leading from the water supply device around the bath to the inlet opening, a waste pipe and a controlling valve designed to control the admission of water from the circulating pipe to the waste pipe and the interior of the bath, as and for the purpose specified.

Joseph Lafrance, Montreal, Quebec, Canada, 19th August, 1913; 6 years. Filed 5th May, 1913. Receipt No. 224,043.

Claim.—An adjustable boiler stand comprising three legs each extending inwardly below the upper end to a concentric point, one of said legs having a ball at the inward extension with a vertical slot therethrough and adapted to fit under and against said ball, the other leg having a similar ball cup and

slot adapted to fit on top and against said ball, and a clamping bolt passing through said slot and holding the legs in their adjusted positions.



No. 150,015. Boiler Stand.

Harold Jarvis, Toronto, Ontario, Canada, 26th August, 1913; 6 years. Filed 6th March, 1913. Receipt No. 221,404.

Claim.—1. In a drinking fountain, a nozzle having the bore enlarged at its outer end provided with a water passage extending laterally outward from said enlargement.

2. In a drinking fountain, a nozzle having a water passage therethrough,

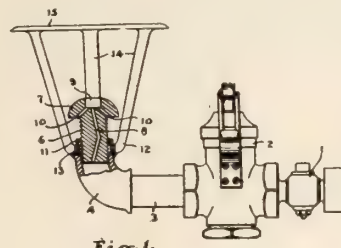


Fig. 1.

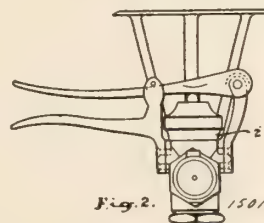


Fig. 2.

No. 150,154. Drinking Fountain.

and a plurality of laterally arranged water passages leading therefrom, said lateral passages having an aggregate

cross sectional area exceeding the area of said main passage.

3. In a drinking fountain, a nozzle having a bore of relatively small diameter and a top extending above the outlet of said bore provided with an opening of greater diameter than the said outlet, means being provided for the escape of water if the opening in the top be closed.

4. A drinking fountain having a single discharge nozzle arranged with the axis of its bore set at an incline to the perpendicular.

5. A drinking fountain having an upwardly extending single discharge drinking nozzle, the discharge bore of which is arranged inclined from the perpendicular and is enlarged at the upper end, said nozzle also having waste passages extending laterally from the enlarged end of said bore.

6. A drinking fountain having an upturned discharge end formed with an enlarged extremity and lateral discharge passages leading from the bore thereof and discharging from the under side of said enlargement.

7. A drinking fountain having a discharge nozzle formed with an inclined bore, said nozzle being adapted to be rotated to change the direction of inclination of the bore to the front, right or left, and means for locking said nozzle to retain any desired direction of flow of the inclined stream.

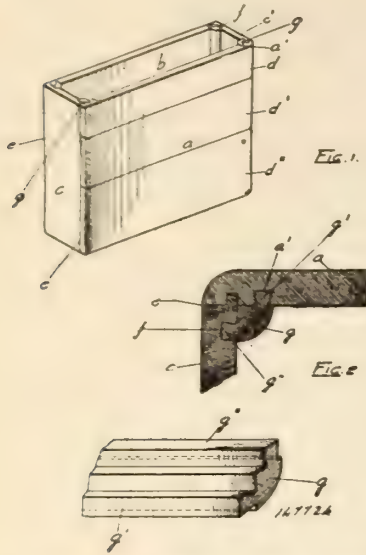
8. A drinking fountain having a single discharge nozzle formed with the passage arranged at an incline to the axis of the nozzle.

The Goderich Organ Company, Limited, assignee of C. K. Sanders, both of Goderich, Ontario, Canada, 29th April, 1913; 6 years. Filed 20th December, 1912. Receipt No. 218,244.

Claim.—1. In a closet tank a wooden casing for the water reservoir comprising a plural number of vertical sides, each of said sides having a vertical dovetail groove on its inner face contiguous to the adjacent corner, and a corner batten in the inner angle formed by two adjacent sides, said corner batten provided with two dovetail tongues contained in dovetail grooves in the inner faces of two adjacent sides.

2. In a closet tank, a wooden casing for the water reservoir comprising a plural number of vertical sides, each of said sides having a vertical tapered dovetail groove on its inner face contiguous to the adjacent corner, and a

corner batten in the inner angle formed by two adjacent sides, said corner batten provided with tapered dovetail tongues contained in the tapered dovetail grooves in the inner faces of two adjacent sides.



147,724. Water Closet Tank.

John T. McCracken, Bradford, Kentucky, U.S.A., 25th March, 1913; 6 years. Filed 16th December, 1912. Receipt No. 218,099.

Claim.—1. In a coupling of the character set forth, the combination with co-acting coupling members of a valve carried by one of the members, and a valve actuating device operated by the other member when the members are coupled, said device also constituting means for securing the coupling members together.

2. In a coupling of the character set forth, the combination with co-acting coupling members, of a valve carried by one of the members, and a valve actuating device operated by the other member when the members are coupled, said other member and actuating device having a detachable interlocking engagement.

3. In a coupling of the character set forth, the combination with co-acting coupling members, of a valve carried by one of the members, and a valve actuating device operated by the other member when the members are coupled, said other member and actuating device being provided one with a socket and the other with a projection that detachably engages in the socket.

4. In a coupling of the character set forth, the combination with co-acting coupling members, of a valve carried by one of the members, and a movable valve actuating arm with which the other carrying member detachably interlocks.

5. In a coupling of the character set forth, the combination with co-acting coupling members having communicating passages therethrough, of a reciprocating valve that slides transversely across one of the passageways, and a swinging valve actuating arm engaged with the valve,

WATER POLLUTION TO BE PREVENTED.

Nearly Seven Million People Will Be Affected by Reforms.

Canadian Press.—One of the most important sanitary investigations ever undertaken in America has practically been concluded by the International Joint Commission, and in a few months legislation probably will be recommended to Congress and to the Canadian Parliament looking to the prevention of water pollution along 2,000 miles of the northern international boundary.

The investigation, authorized by the treaty of 1910 between the United States and Canada, was begun last spring, and although it has taken only six months, has covered the territory that lies between the head of Lake Superior and the point where the St. Lawrence River ceases to become the boundary line between the Dominion and the United States. It has taken in hundreds of square miles of territory in the Great Lakes and the streams which connect them, and has gone over into the country drained into the St. Lawrence by the St. John River in Maine.

Millions Vitrally Interested.

Duluth, Sault Ste. Marie, Detroit, Buffalo, Niagara Falls, Rochester in the United States, and many cities and towns in Canada are concerned in the investigation and in the legislation which may result from it. According to the estimate of America's officers of the commission, between six and seven million people are vitally interested in the prevention of water pollution in this area.

While the enquiry has been directed solely toward the discovery of sewage and has not looked to the typhoid bacillus, it is regarded by sanitarians in Washington as one of the most important ever undertaken, since it is not a warranted presumption that in sewage-polluted water the germs of typhoid and other deadly diseases will be found.

The commission's findings will not be made public for several weeks, but it is generally understood here that while they are not alarming, they will disclose conditions along most of the 2,000 miles stretch that should be remedied to better health conditions.

Will Engage Experts.

While the work has been performed under the direction of an organization

which has a membership of three from the United States and three from the Dominion, most of the maps made and data gathered have been kept in Washington. A meeting of the full commission will be held next month.

It is highly probable the report on conditions will lead to the employment of the best sanitary engineers and experts on water pollution in the United States, Canada and possibly Europe, to clean house along the Great Lakes and the border. The problem of prevention is admittedly so big that American members of the commission have hardly considered it at all, and confess that the best experts in the world should be chosen to tackle it.

COBALT DRAINAGE PROBLEM.

Cobalt.—The draining of Cobalt Lake is not as simple an affair as were the similar operations at Kerr Lake. Plans of the proposed de-watering system have been filed, and these plans show extensive operations in the vicinity of Cobalt Lake and other lakes in the same basin. At Short Lake a dam is to be constructed to make a reservoir of that body of water, as well as Brief Lake. From Short Lake a pipe line will be laid along the bottom of Cobalt Lake to a huge reservoir to be erected when the lake is pumped dry. This reservoir will give a supply of water to the various mines which are to-day dependent on Cobalt Lake for their supply. The drainage of the lake will be through Farr Creek, along the present course.

For the town the plans submitted by the company show changes which they will endeavor to prove are much better than those in existence to-day. From this large reservoir water will be supplied for fire protection purposes, which will give a better head than that at present existing. The reservoir will be connected with the town by means of hydrants, from which the pressure would be derived.

To overcome the difficulty which might exist in reference to the disposal of sewage, which now flows from the town into Cobalt Lake, an entirely new system is involved, which, in addition to taking care of residue, provides a treatment for the sewage before it is piped to Farr Creek. This system, they will endeavor to prove is much better than the one at present existing.

Mining Commissioner T. E. Godson will hear the various parties in the case at Toronto early in December. It will probably take considerable time, as there will be many witnesses.

Processes Necessary to Complete a Common Globe Valve

A Series of Articles Showing in a Simple Way the Operations Required to Complete a Nickel-plated Globe Valve—Following the Steps From the Drafting Office to the Radiator.

In a recent issue of Sanitary Engineer, mention was made of brass goods, which, on account of the careless handling during the installing, it was thought, possibly a few words on the process of manufacture would be interesting.

It is felt that sanitary engineers as a whole have no idea what amount of work there is involved in the making of one of these valves.

The Drawings.

First of all the style is decided upon and a draughtsman is consulted. He is told the kind, the size, the weight or thickness of metal which is necessary. This man must be an efficient mechanical draftsman and is expected to know the thousand and one things which are embodied in such a piece of mechanism.

A 2-inch Globe Valve.

It may be the drawing has to be of full size, and if such is the case he will require to know whether he is to allow for shrinkage. We may state, though, that as far as we know it is not usual practice to ask the draftsman to take shrinkage into account; this is left to another mechanic, viz., the pattern-maker.

One thing the draftsman does take into account, and that is the machining, all these details such as the threading, number of threads per inch, the pitch of them and the necessary taper to allow, etc.

The Wood Pattern-maker.

After the draftsman has been dispensed with and every detail has been gone over, the drawings along with specifications are then handed to the wood pattern-maker. This craftsman has to be a thorough expert in his line, he must not be a half and half by any means; he must know every move which has to be made from now on to the finished article.

For instance, if there is to be a large number of valves made off the pattern, he is told first that metal patterns are to be made. He is told what kind of material the metal patterns are to be made from. This will at once let him know how much larger than actual size he has to make his wood patterns. He will also have to know whether the finished metal patterns are to be gated or put on a match plate. If the former, then the wood patterns will be made to exact model of the finished valve. Of course

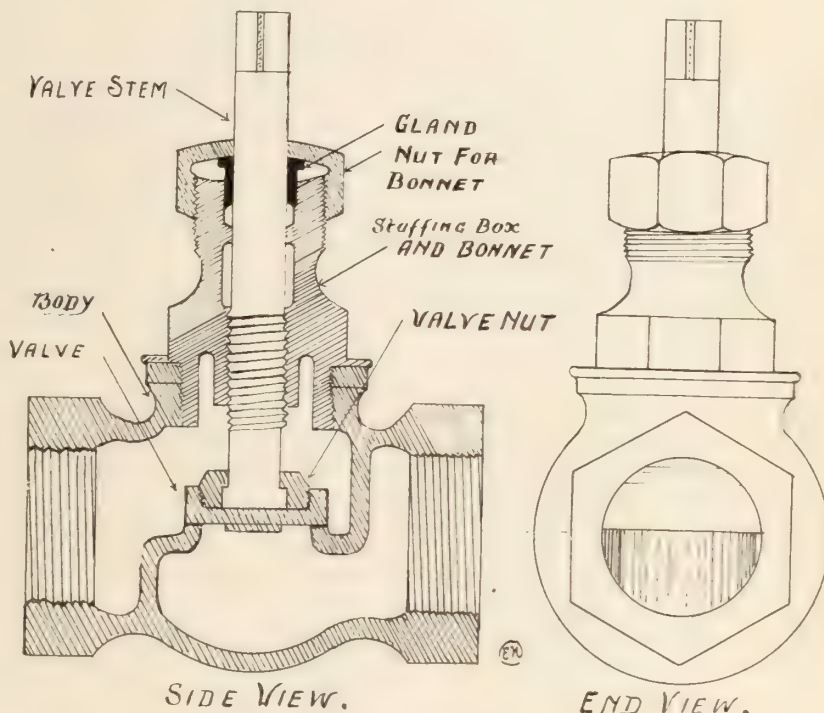
we refer to the parts of which there are many, and which may be seen in Fig. 1 and 2. Then another condition has to be considered. If the machine shop is an up-to-date one and there are automatic turret lathes in use, several parts will be made from brass rods. This will dispense with the services of both the pattern shop and foundry. If, however, such machines are not on hand, a pattern in wood must be made of all parts except the stem; this can be turned up in brass if necessary, and if such a method is adopted, then only one shrinkage is necessary to be allowed.

and on cooling it contracts, or, shrinks.

Thus we term this as shrinkage and as aforementioned, if the pattern is made of wood in the first place, then a metal pattern after, then an actual casting, there would be two shrinkages to allow for as well as the cleaning up of the metal pattern.

Core Boxes Next.

This pattern-maker has not only to make patterns of the valve, but he has also the core-boxes to make, and if a great number of valves are to be made, it will be necessary to make patterns



If, however, the patterns are to be put on match-plates, the wood patterns will need to be made in exact halves, rights and lefts. We will deal with the meaning of the terms gated patterns and match-plates later on in the article.

What Is the Shrinkage.

It would be well for us to here define what the term shrinkage means. We will examine the drawing and take for granted that it is a full size drawing. The pattern-maker has to know his metals and what amount of contraction will take place in the mold, as the metal is poured hot, it is in an expanded state

for the core-boxes. These too must be made larger to allow for shrinkage and cleaning up. There is, however, another alternative in the making of these core-boxes which is even a more expensive method, and that is when they are made by a die-maker then the material is the best mild steel, which is case-hardened.

The making of core-boxes for such a casting is one which requires great skill and accuracy. They are to be made in two halves, viz., one pair for the inlet and one pair for the outlet. Hence we have really two cores. We are referring to the cores for the body of the valve.

(Continued in our next issue.)

Atmospheric Pressure and Its Relation to Sanitary Engineers

Showing in a Simple Way That Sanitary Engineers Could do Their Work Much More Satisfactorily Providing They Took Time to Study More the Laws of Gravitation, Syphonic Action and Atmospheric Pressure.

By Professor Arthur Bateman

Sanitary Engineers cannot pay too much attention to this subject, for without a thorough knowledge of the composition, weight, pressure, and peculiar properties of the atmosphere we cannot hope to understand the working of siphons, pumps, automatic flush tanks, siphon jet water closets, the use of vent and re-vent pipes, the collapsing of boilers, etc., etc.

The air above us is composed of a number of gases, which possess weight, and exert an enormous pressure at sea level.

At a distance of fifty miles above the earth, we have to speculate on its composition and density, but as we descend it is found to increase in density very rapidly, and on reaching the sea level we observe a weight or pressure of 15 pounds on each square inch of surface.

However, it must not be forgotten that this pressure acts in every direction, and for this reason is unnoticeable under normal conditions.

A very simple experiment which readily proves the above assertion, is to procure an ordinary glass tumbler, and a piece of note paper. Completely fill the tumbler with water. Place the paper over it, then invert the tumbler. It will be discovered that the piece of paper retains the water in position, showing that the atmosphere exerts a pressure of 15 pounds on each square inch of surface, and in an upward direction.

Should the tumbler be partly filled, we will have a pressure equal to the 15 pounds per square inch on both sides of the paper, and in addition the weight of the water, which will force the paper down and flow freely out.

The density, temperature, composition and properties of the atmosphere at very high altitudes are discovered with the aid of a sounding balloon, to which is attached a number of delicate self-recording instruments, and a parachute.

The balloon explodes at a certain altitude, liberating the parachute, which finds its way to land along with the instruments, and the latter indicate the precise conditions through which they have passed. It may interest readers

to learn that these balloons have attained an altitude of 19 miles.

Now all syphonic action is dependent upon atmospheric pressure for its working, and it will be my endeavor to point out a number of practical examples.

Take for instance the common siphon. This usually has the form of a bent tube with one arm or leg longer than the other, and is used for transferring liquids from one vessel to another at a lower level.

Let us assume that we have a receptacle containing a liquid into which dips the short leg of the siphon, while the longer leg remains below the receptacle with open end. To operate the siphon, the air in the tube must be exhausted by applying the mouth to the open end, or displacing the air with water poured down into it. A partial vacuum (space void of matter) is thus formed and the liquid is forced up the tube by atmospheric pressure, which is pressing on the surface of the liquid in the receptacle with a force equal to 15 pounds on the square inch.

This pressure is sufficient to support a column of mercury 30 inches in height. The specific gravity of mercury being 13.6, or in other words, mercury being 13.6 times heavier than water, bulk for bulk, we learn that $30 \times 13.6 = 408$ inches = 34 feet, which is the maximum height the water will be raised.

In practice it is usual to base all calculations on a vertical height of 28 feet, whilst the maximum for pumps may be taken at 25 feet, as much slip is lost through defective valves.

An intermittent siphon is similar to the above, but the flow is not continuous. The arrangement is such that the outflow of the siphon exceeds the inflow, consequently the water level is lowered until it reaches the short leg of the siphon, admitting air and producing an equal pressure on each side, which immediately causes the flow of water to cease.

Automatic flush tanks also rely on this valuable atmospheric pressure for their working. In this extremely useful appliance, the inflowing water can be regulated to a nicety, and the tank operate

every few seconds or days to meet the requirements for which it is installed.

The incoming water raises the level of the water in the tank until it flows down the stand pipe or flush pipe, displacing the air, reducing the pressure, with the inevitable result, siphonage is set up.

Water closet flush tanks operate in much the same manner, only siphonage is commenced by the pull of a chain or other contrivance, which raises either a valve or plunger and allows an amount of water to displace the air. Then the weight of air pressing on the surface of the water in the tank accomplishes the rest.

Another example is the siphon-jet water closet where a jet of water is forced upwards through the trap, carrying with it part of the seal. This coupled with the water flowing through the rim, produces a partial vacuum, resulting in the whole contents of the bowl being speedily forced through the trap by atmospheric pressure.

Still further, let us consider the working of the ordinary pump. As the piston descends the air contained in the barrel is compressed and escapes through the top valve, the bottom valve being closed by the increased pressure of the air above it, the water remaining at the same level in the suction pipe whilst the piston is descending. When the piston is again raised, the pressure is removed from above the bottom valve and the air underneath it at once opens the valve and occupies the space in the pump barrel, the water continuing to rise in the suction pipe as before. This action continues until the water rises to the level of the bottom valve and on again raising the piston the water enters into the pump barrel, providing the height is not greater than 25 feet. On the piston again descending the pressure of the water beneath it opens the top valve, the piston meanwhile passing through the water. This action is continued until the water is discharged at the spout, the barrel being recharged with water from the suction pipe. The water having once entered the pump barrel the contents are discharged at each upward stroke of the piston.



Subscribers Are Urged to Send Questions to be Answered, or to Comment on Letters Published. Descriptions of Jobs Done or Shop Kinks Are Also Invited.

THIS TRAP SYPHONS.

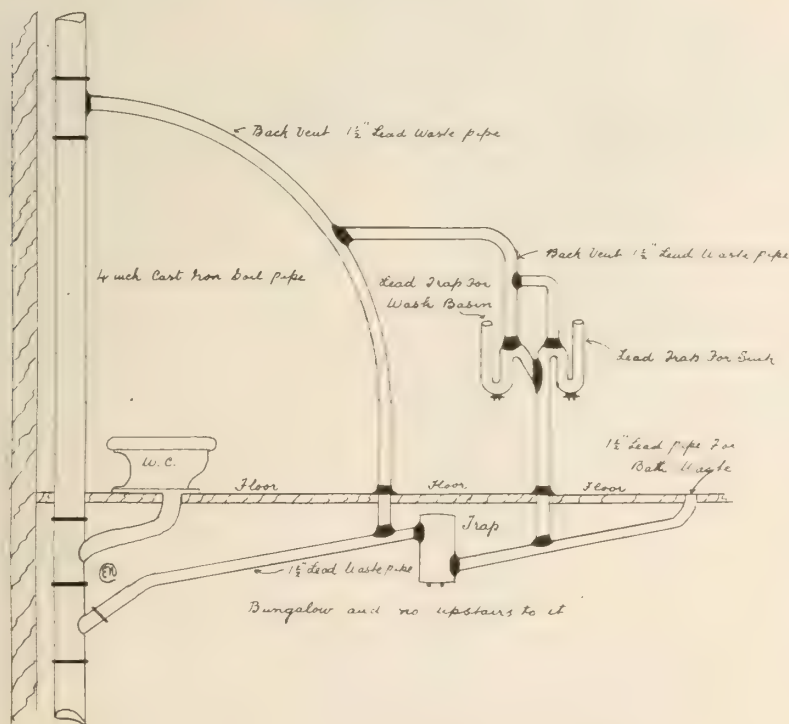
Editor Sanitary Engineer.

Dear Sir,—Enclosed please find a diagram of a plumbing job installed in this town as shown its back vented, and has no house trap. Owner claims the trap shown on diagram syphons itself dry, causing sewer gas to escape into the house. This happens about once a month.

Kindly give me your opinion in the next issue of the Sanitary Engineer if

what may happen is this: When there is a discharge from either the basin or sink, or even both, there is bound to be a certain amount of odor forced through the bath waste, because, as will be seen, the water from these fixtures have to flow through and force the water out of the trap under the floor. This trap is placed in the wrong position to act properly. There is no instance or condition where a trap should be placed so far away from the fixture.

should be carried out. The chief point to be remembered is, always bear in mind that no obstruction should be placed on a waste pipe where more than one fixture is being drained. Another very bad practice, too, is shown in this sketch, and that is the connecting of two traps together. We do not think it possible to get sanitary results from such an installation. Hence our reason for submitting a proper method which is simple and no more costly except that another piece of pipe is required for the basin waste, so that each of these fixtures, viz., sink and basin, shall be entirely separated.—Editor.



Unsanitary layout of plumbing installation.

the job is put in wrong and oblige,

Yours very truly, S. E. S.

Replying to S. E. S., we may state it is rather doubtful that the trap shown in Fig. 1, which we believe he is referring to, does actually syphon itself. But

All traps should be installed as close as possible to its own fixture. We may say that any freak occurrence may happen when fixtures are installed, as here shown in Fig. 1. We have, therefore, submitted a plan which in the main

IS THERE TECHNICAL SCHOOL IN TORONTO.

Editor Sanitary Engineer,—

Dear Sir,—Kindly let me know if there is a technical school in Toronto and if so I would be much obliged if you could furnish me with the address of the secretary of the institution.

Your truly,

F. H., Perth, Ont.

Replying to F. H. we may state that there is a technical school in Toronto, with different branches which are as follows:

The Central Technical School,
149 College St.

The Humberside Branch,
Humberside Avenue.

The Riverdale Branch,
Gerrard St., east.

The George Street Junior Branch,
George St.

The name and address of the secretary-treasurer is W. C. Wilkinson, Esq.,

Secretary-Treasurer of Technical
Schools.

City Hall,
Toronto.

Editor.

POOR WORKMANSHIP.

We have a question submitted to us by one who signs himself "Inquisitive."

If Inquisitive will send us his name and address simply as a guarantee of good faith, we will treat his question in the usual way. Editor.

VAN HAND BOOK.

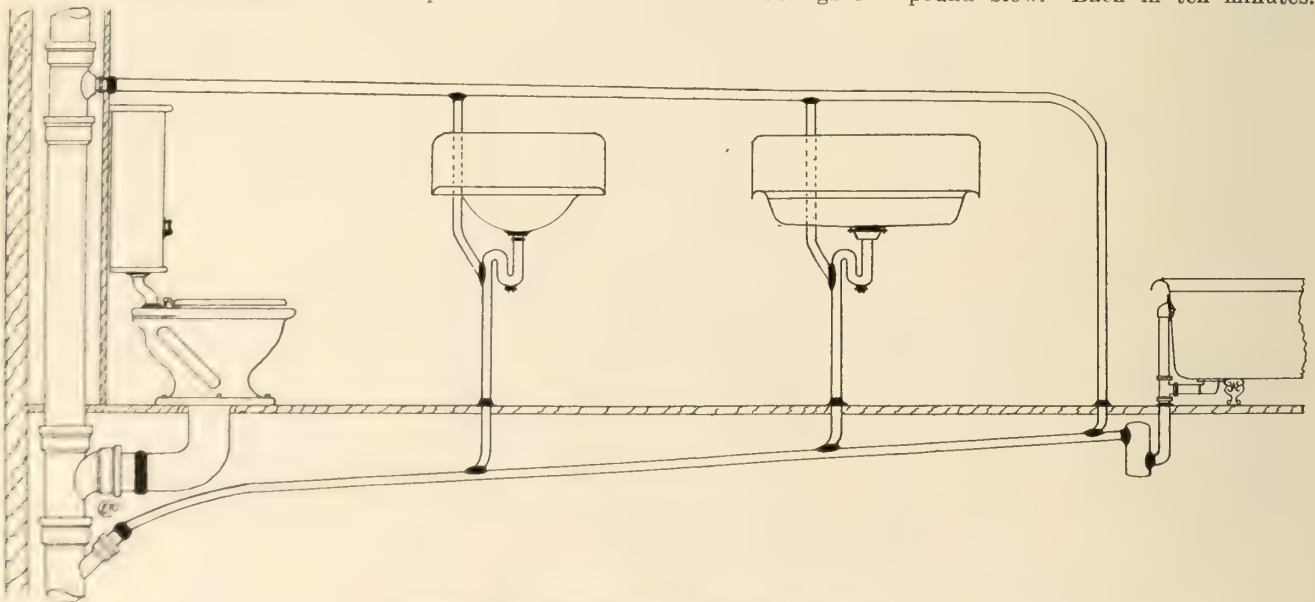
The Van Expansion Bolt Mfg. Co., Chicago, have issued a very interesting book on expansion bolts. It is full of useful information for the sanitary and heating and ventilating engineer, and



should be in the possession of every one interested in this line. This booklet can be procured free by writing to, The Van Expansion Bolt Manufacturing Co., Fort Dearborn Building, Chicago.

DOUBLE RANGE CONNECTION.

Editor, Sanitary Engineer,— Please inform us in an early issue how to properly connect two ranges to one range boiler. One range is in the basement and directly under another range in the kitchen, besides this information could



Properly laid out system of plumbing.

you give the size of piping necessary for good circulation?

Yours respectfully,

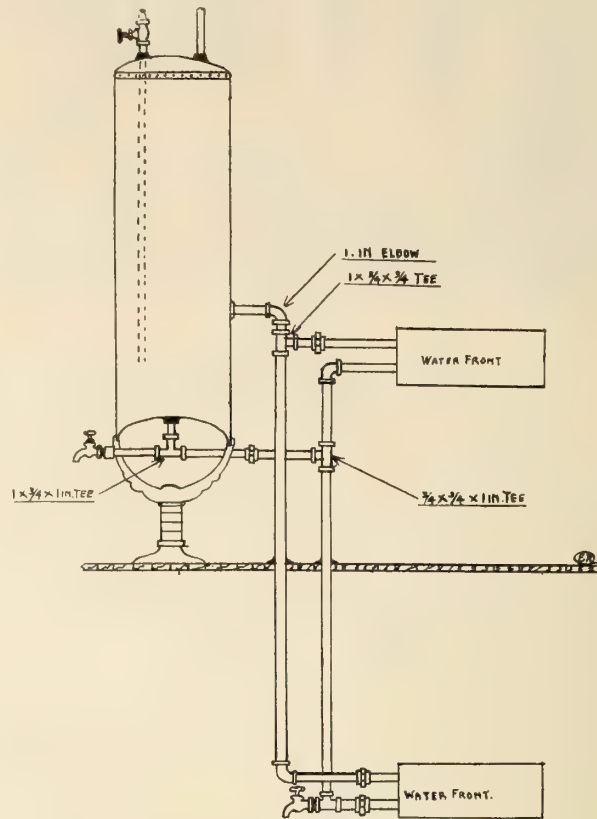
A Constant Reader.

Replying to our correspondent, "Con-

stant Reader," This question of range connections is one which is almost always of interest. There are so many ways and all have novel ideas embodied in them, we herewith show a very popu-

The Blow Never Touched Him.

During a heavy shower a man with a very wet overcoat entered a Boston hotel to pay a business call upstairs.



Double Range Connection.

lar method of connection, one which has been known to give every satisfaction. The sizes of pipe and fittings too are shown as requested by our correspondent. One of the chief fittings in

Not wishing to take the dripping coat with him, he hung it in the hall and pinned this note to it: "This coat belongs to a man who strikes a two-hundred-pound blow. Back in ten minutes."

range boiler connections is the union. These should always be of a metal to metal type as the intense heat causes the rubber gaskets to vulcanize and after a while they cause trouble and leak.—

When he returned, his overcoat was gone and in its place was his note with the addition: "P.S. Taken by a man who walks ten miles an hour. Won't be back at all."

Complete Course of Sheet Metal Work

By L. W. KOSER

On Plate 39 we show an elevation of a sheet metal store front, as well as a partial side view and a section showing the construction. This plate is presented for the purpose of showing the student some of the possibilities of his trade, and to make him familiar with the different technical or architectural names.

The principle of developing the patterns for everything shown on this plate has been gone over in the series, and the tinner should find no difficulty in producing a work of this kind, of course it being necessary to purchase the stamped ornaments and sidings from some firm making these.

The elevation gives the names of each of these and their location.

Everything shown on the elevation is or can be made from sheet metal except, of course, the window glass.

The woodwork on such a building is of the cheapest and roughest, the section showing how it is constructed.

The outside is lined with rough board sheathing, and the metal applied thereto.

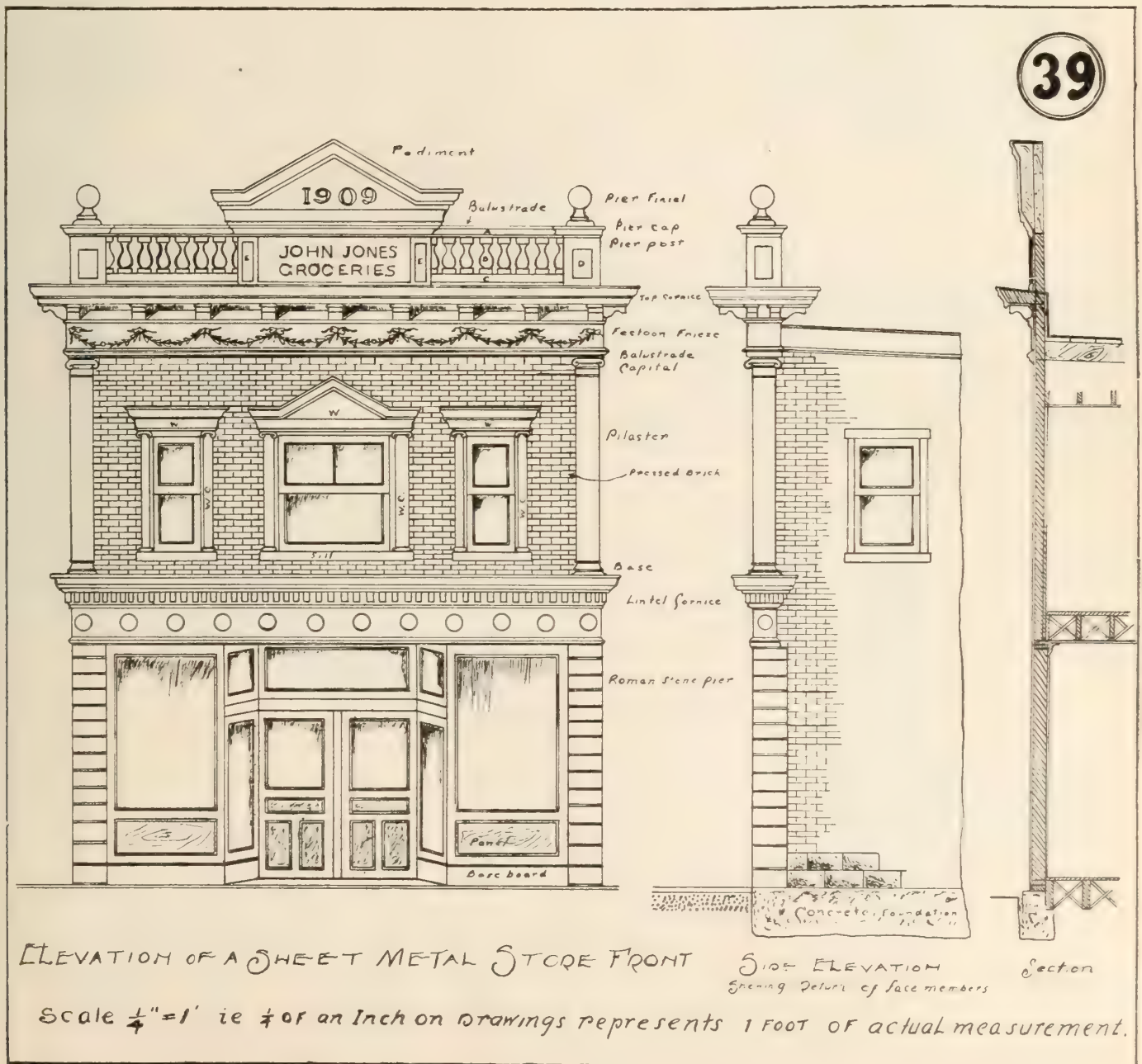
Two or even three layers of building paper can be used under the metal to help keep a normal temperature inside. The inside of the building is lined with dry hemlock lumber (or cheap brand of another), is covered with one or two layers of building paper, and then finished with a nice design of metal ceiling and side walls, the roof being covered with standing seam roofing.

The metal front can then be painted to represent stone, brick and wood the stone parts to be painted a grey color and while the paint is still fresh to be sanded to represent sandstone, that is loose sand is blown on while the paint is tacky and adhering thereto gives the appearance of being made from sand stone.

This treatment is given to the pediment, Balustrade, cornices, window caps, columns and sills, pilasters and piers. The brick finish is given to the brick siding it being painted a brick red and striped with grey or mortar color.

The window sash frames, door casings and frames and panels can be painted white or wood color and grained.

On the drawing A, B and C from the



balustrade, A being the top rail, C the bottom rail and B the balustrade, P of the pier post is a sunken panel as is also E-E of the pediment, W represents window caps and C window columns.

The other parts are indicated by name in full.

On Plate 40 the last plate of the course we take up, metal ceiling work or what concerns the jobber most, the erection of metal ceilings. What we aim to teach you in this lesson is how to take first the measurements of surface to be covered and to give to the firm from whom you are ordering the material full and comprehensive information. Then now to figure. We are asked to figure out the cost or arrangement of design and how to start and finish the work.

We will suppose we are asked for an estimate on a metal ceiling to cover the ceiling and walls of a store. The price

for ceiling and walls to be separate.

We first make as neat a diagram as we can on the wall line near the ceiling showing the location of all obstructions, such as vestibule entrance, chimney breasts, etc. We show on the plan of ceiling any openings such as Stair-wells, Skylights, Elevators, etc., each of these obstructions are carefully located by measurements from the nearest wall and from each other and their own size carefully given.

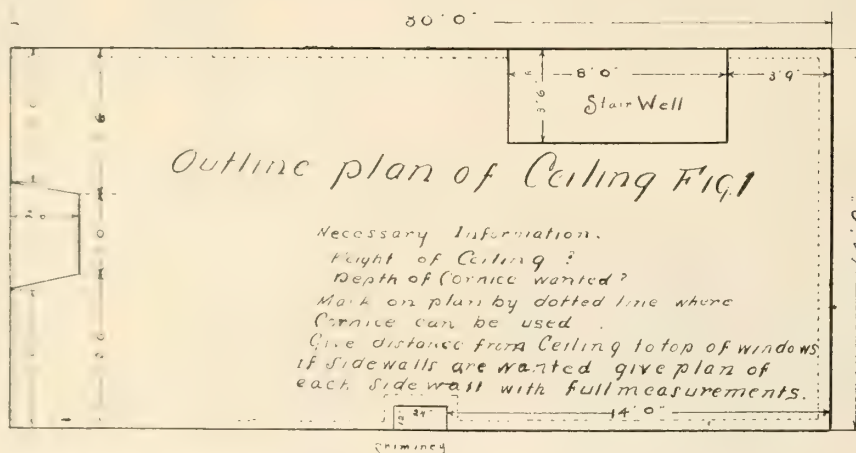
Next we decide about how deep we want the cornice to be or how far down on the wall we want it to come. This is restricted in most cases by the height of ceiling, distance above window and door casings, and amount of money your customer wants to spend. However, we decide on the depth we want and as there may be some places where it cannot be used on account of windows going to

ceilings as in most store fronts and in cases where stair-wells are open and their edges flush with ceiling or not deep enough to carry our cornice. We therefore, delineate on the plan by a dotted line just where we want the cornice to go and mark the places where we want to finish with a moulding. We now figure up the ceiling as follows:—

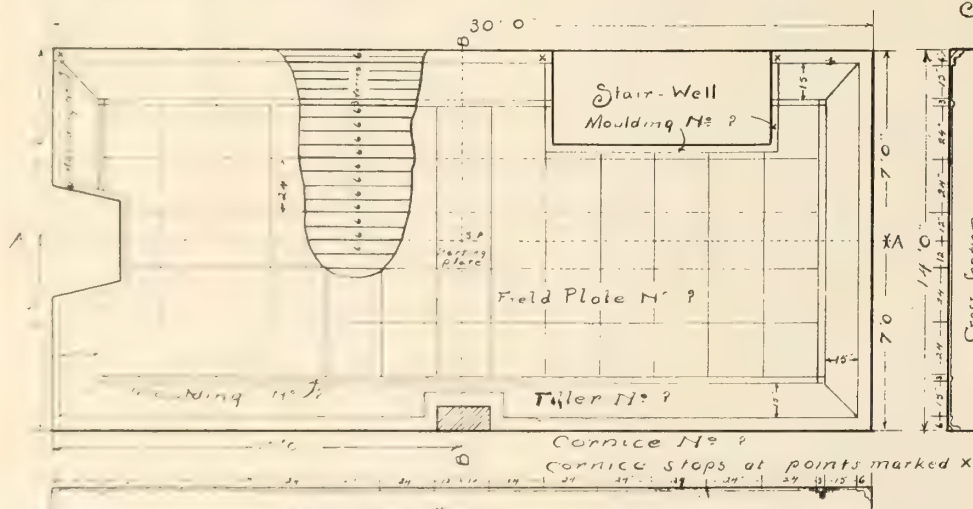
Take the total amount of square feet of surface to be covered including the depth of cornice and 1-3 of the area of each opening and add to this a percentage for waste in cutting and matching material. This percentage decreases in direct ratio to the increase of surface. Some rooms, however, on account of being cut up require more waste than another of the same size, but for ordinary calculations we may use the following table:—

(To be continued.)

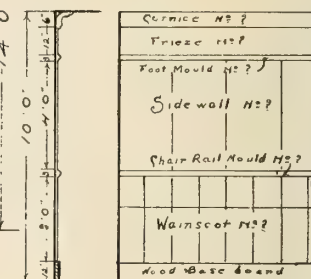
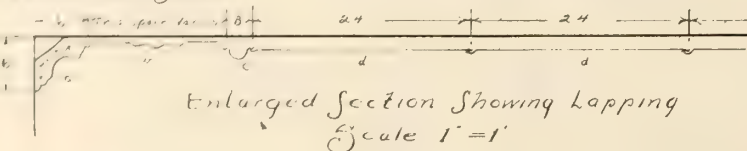
40



PLAN OF METAL CEILING FIG 2



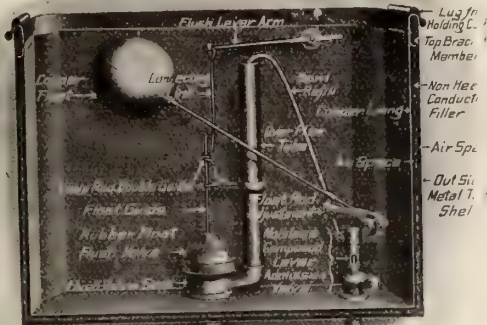
Enlarged Section Showing Lapping



Sec of Sidewall plan Fig 3



Ever have a Tank split on you? Guess you have.



Sometimes it's the fault of the Woodwork. Generally it's caused by the conditions to which the Woodwork is subjected—damp surroundings, or unusual exposure—sometimes rough usage.



Wood Closet Tanks are being largely replaced by Metal ones. When wanting your next Standard Low Tank Outfit, try the "Met-all."

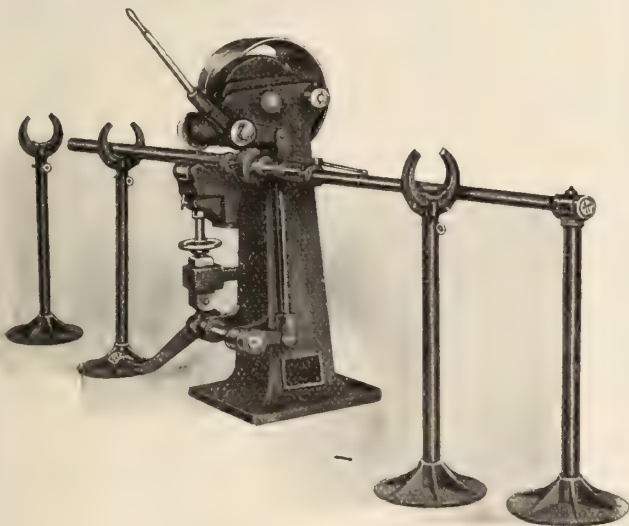
It is constructed of a strong Metal Shell, beautifully finished on the outside in White or Oak, with a Sanitary Enamel which will not discolor. Tank is Copper lined and has a non-heat Conductor Filler between outer Shell and Lining, and which prevents sweating.

The seats are moulded of Wood Fibre and are as hard as ivory, and absolutely impervious to moisture and acids. They will not split, warp, craze or discolor.

The All-White Met-all will give your customer perfect satisfaction and pay you a splendid profit.

A card will bring you illustrated circular and price. We have everything you need in high-grade supplies. Our prices are reasonable.

The James Morrison Brass Mfg. Co., Ltd.
93-97 Adelaide St. West, TORONTO



The Hall No. 2 Rapid Upright Roller Pipe Cutter for Rapid Work and a Clean Cut

By repeated tests this machine has proven the most efficient and economical pipe cutting device on the market, and is used for this purpose by all of the tube mills in Canada and most of the leading plumbing and steam-fitting houses.

Regular capacity $\frac{1}{2}$ to 2-in., with extra cage will take $\frac{1}{8}$ to $\frac{3}{8}$ -in. pipe.

Write us for catalog and prices on pipe threading lathes, any capacity from $\frac{1}{8}$ to 18-in., also single and double head rapid nipple machines. No delays, delivery from stock.

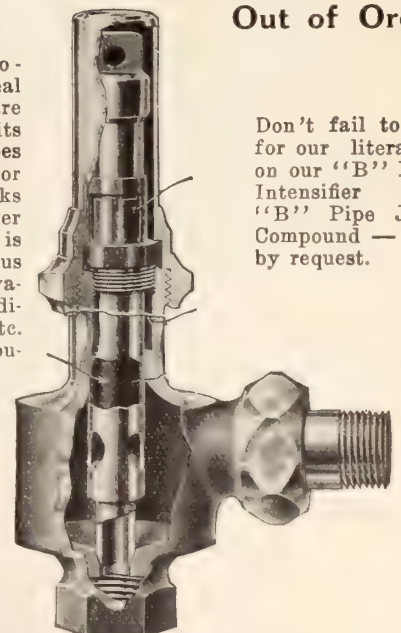
JOHN H. HALL & SONS, Limited
BRANTFORD, CANADA

NATIONAL VALVES

Are Ordered and Reordered
—Never Get Out of Order

National Thermo-static is an ideal valve. Its claims are based only on its deeds, and it does what is claimed for it and more. It works faithfully and never jumps its job. It is adapted to various work. For use on vacuum systems, radiators, heat coils, etc. No deformation troubles possible; the brass encased composition prevents it from being buckled or bent.

More merits about the valve by writing for more information.



Don't fail to ask for our literature on our "B" Heat Intensifier and "B" Pipe Joint Compound — free by request.

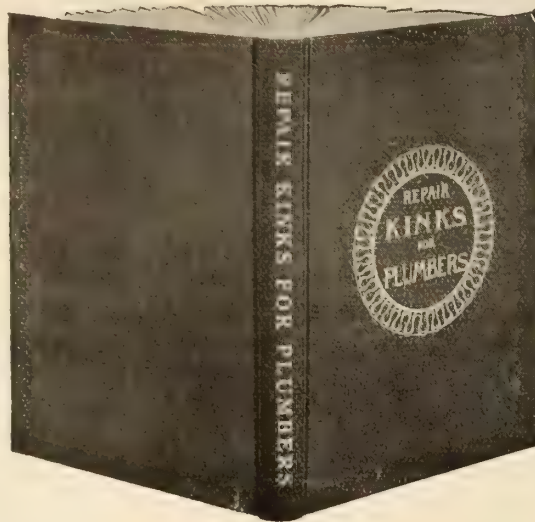
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It will appeal especially to the man controlling a repair business. It will be equally useful to those in charge of buildings. Its table of contents gives some idea of its great scope, no less than 26 subjects being mentioned. Here are some of them:



The matter of taking up the repair of the appliance most commonly out of order, the Kitchen Sink; The Service Pipe, methods of freezing for repair work, etc.; Fuller Bibbs are touched on, as are also leaky Waste Connections; a clear and concise description is given of the action of Flushometers.

Space will not permit us enumerating further the many questions, etc., which are treated very fully in this extremely practical and valuable book. Price 50c postpaid.

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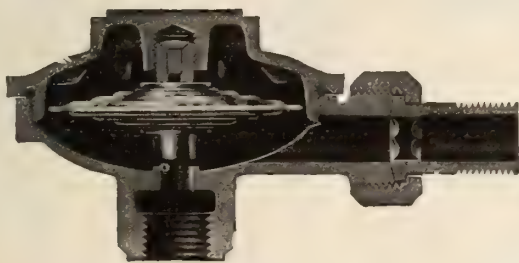
Spells 100% efficiency in Vacuum Heating. Comprises all that is modern, up-to-date in your line.

Means the building of your reputation for reliable work and up-to-the-minute methods.

A guarantee against all heating troubles, and one that is backed by years of unexcelled service. Anyone can guarantee, but the JOBS THAT SATISFY ARE THE ONES THAT COUNT. We have them.

Do you want this reputation for efficient work, up-to-date methods? Then investigate

The Dunham Radiator Trap



(Made in Canada)

Performs the functions of a Radiator Steam Trap, perfectly and continuously. Eliminates water and air without loss of steam.

Write for particulars of our "Try Out Plan."

C. A. DUNHAM CO., Ltd.
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We challenge any Plumber, any time, anywhere, or any gas-fitter or electric-conduit fitter, to use the T. R. I. O. Pipe Stock for one week, without becoming its friend.

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Your dealer is authorized to make this challenge good.



The Keenest Little Helper That a Plumber Ever Had.

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LIMITED
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Send and get "The Emancipation of the Plumber," a little book on pipe threading and "traditional fallacies."

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GOOD OPPORTUNITY

PLUMBING, TINSMITHING, STOVE AND Hardware Business for sale, in Grimsby Village. Apply 752 King Street East, Hamilton, Ont. (19)

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WANTED—HOT WATER BOILER SUIT-able for 8-roomed house. Must be in good repair. State size and price. Apply to Norman Brooks, Box 245, Fergus, Ont. (24)

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The Editor wishes every one interested in

Domestic Sanitary Heating and Ventilating Engineering

to make use of this paper. Any article or problem of interest, any topic of note will be used if any such has a tendency to uplift the Trade.

Every local or provincial association can use this paper free of charge to make other members acquainted with the business done and benefits derived from being an organized body.

STUDY**These Uncrowded Professions**

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SUCCESS GUARANTEED.

Write for free booklet.

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FOR
SEPTIC TANKS

WATSON AND PAUL
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GENUINE ARMSTRONG STOCKS and DIES

FOR THREADING PIPE OR BOLTS

KNOWN, USED,
COMMENDED EVERYWHERE

PIPE MACHINES,

both Hand or Power

HINGED PIPE VISES

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**THE ARMSTRONG M'F'G.
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WRITE FOR CATALOG

No other needed!



A Williams' "Agrippa" Chain Wrench will assuredly save your buying and carrying an extra tool because of its universal adaptation to both pipe and fittings work.

The close-to-the-ceiling and the pinched-for-space propositions are all "meat" for the Williams' "Agrippa" single jaw.

If you had but one dollar to spend and an endless number of tools to choose from, you could not "go wrong" on a Williams' "Agrippa." An "Agrippa" will do everything that is possible with any other sort of pipe wrench and much more.

The reliability, both for strength and service, is established before it goes to you—We prove it by test, and the price is in your favor, too.

Go to your dealer for tools on trial. Return 'em if not as represented.

J.H. Williams & Co.

Superior Drop-forged Tools

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James Morrison Brass Mfg. Co., Toronto.

Brass Pipe and Tube.
Empire Brass Mfg. Co., Toronto.

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Warden, King, Ltd., Montreal.

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Standard Heating & Radiator Co., Pittsburgh, Pa.

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Anglo-American Sanitary School.

Country Residence Equipments.
National Equipment Co., Toronto.

Closets.

Empire Brass Mfg. Co., London.
James Morrison Brass Mfg. Co., Toronto.

Drainage Fittings.
Fittings, Limited, Oshawa.

Ejectors, Steam.
James Morrison Brass Mfg. Co., Toronto.

Ejectors for Sewage.
Chicago Pump Co., Chicago.

Fittings.
Fittings, Limited, Oshawa.

Generators.
Honeywell Heating Specialty Co., Montreal.

Heaters.
Steel & Radiation, Ltd., Toronto.

Lead.
Canada Metal Co., Ltd., Toronto.

Machinery Pipe Threading.
Hall & Sons, Ltd., Brantford.

Nipples.
Canadian Tube & Iron Co., Ltd., Montreal.

Packing.
Canadian Johns-Manville Co., Ltd., Toronto.

Pipe, Black and Galvanized.
Canadian Tube & Iron Co., Ltd., Montreal.

Pumps.
Leader Iron Works, Chicago.

Radiators.
Warden, King, Ltd., Montreal.

Steam Specialties.
Dunham, C. A., Co., Toronto.

Tools.
Canadian Tap & Die Co., Ltd.

Unions.
Dart Union Co., Ltd., Toronto.

Valves.
James Morrison Brass Mfg. Co., Toronto.

Welding.
Warden, King, Ltd., Montreal.

Wire.
Canada Metal Co., Ltd., Toronto.

Yokes.
Canada Metal Co., Ltd., Toronto.

Steel & Radiation, Ltd., Toronto.

Pipe, Soil, and Fittings.
Empire Brass Mfg. Co., London.

Pumps.
Leader Iron Works, Chicago.

Radiators.
Warden, King, Ltd., Montreal.

Steam Specialties.
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Canadian Tap & Die Co., Ltd.

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Nothing Like It as a Compression Stop and Waste—It's a Winner

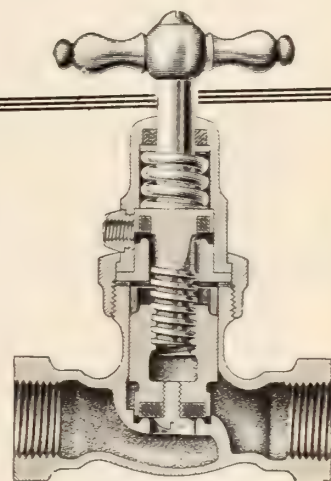
Progressive plumbers everywhere are using MUELLER COMPRESSION S. & W. COCKS, the best thing of the kind ever offered the plumbing trade.

Order some of these cocks for your next job, you'll be pleased with them—so will your customer.

Mueller Stop and Waste Cocks are mechanically perfect. They can't waste until entirely shut off. No pressure passes through the waste hole. Every part is interchangeable—a big, strong point if you should ever need a repair. You're not apt to need it, however — these cocks are built to wear.

They are tested under 200 pounds hydraulic pressure and unconditionally guaranteed.

H. MUELLER MFG. CO., Ltd.
Sarnia, Ontario, Canada



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S.E.

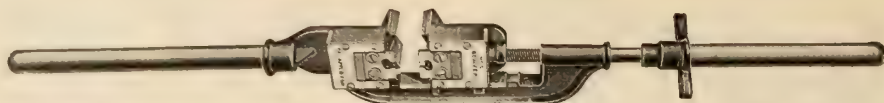
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Mfg. Co. Ltd.**
Sarnia, Ont.

Give me further
information and
prices on Mueller
Compression S. & W.

Signed.....

City..... Prov.....

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Cutting Pipe—or Hacking it off?



Done With Ordinary Pipe Cutter.

Which do you do when you cut a pipe? Do you get the ends uneven and burred, the pipe itself perhaps split; or does your cutter make an even, perfect job that requires no reamer or filing?

If It's a

Beaver

Square End Cutter



Cut With "Beaver" Square End Pipe Cutter.

nobody will ever be able to accuse you of "hacking it off."

The "Beaver" cuts straight and true with a minimum exertion. In action it's just working a die stock. You simply close it in on the pipe, it feeds itself automatically.

Figure up the time you waste, fixing up pipe cut in the old way—then go to your dealer and have a look at the "Beaver." It will pay you, so do it now.

BORDEN-CANADIAN COMPANY, Toronto, Ontario

WOLVERINE QUALITY

Wolverine "One Piece" Basin Supplies

(Patented)



Separate Wolverine Flexible Joint Connection. Furnished on any $\frac{3}{8}$ -inch I.P. Basin Supply by specifying "C" after figure number.



Lead Cone Packing. Furnished on any Supply instead of Rubber by specifying "L" after figure number.



To receive $\frac{1}{4}$ inch I.P. Tall Piece. Furnished on any $\frac{3}{8}$ I.P. Basin Supply by specifying "R" after figure number.

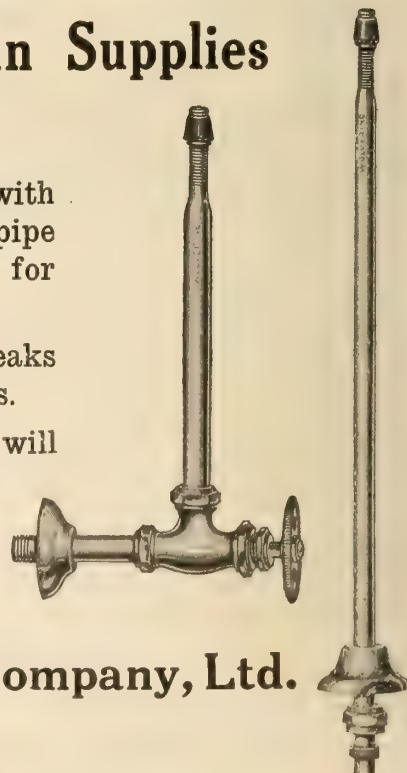
Special annealed brass tubing with slip joint nut for $\frac{1}{2}$ -inch iron pipe or with $\frac{3}{8}$ -inch I. P. Thread for floor or wall connections.

The Flexible Joint eliminates leaks at connections under the basins.

Heavy deep flanges which will not dinge, as is often seen with inferior fittings.

Manufactured by

Canadian Wolverine Company, Ltd.
Chatham, Ont.



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RADIATOR VALVES



Perfect Radiator Service

Depends Wholly Upon the Valve.

No matter how perfect the system, a leaking valve makes regulation of temperature impossible. With the JENKINS BROS.' VALVES, perfect contact and consequent tightness is ensured by the use of the JENKINS DISC, which eliminates leakage through a valve due to improper contact between the seat and the clapper. JENKINS BROS.' radiator valves have heavy bodies—substantial trimmings and are made of a fine grade of steam metal. The workmanship throughout is of the best.

Made in various styles—fitted with either wood, brass or iron wheels, also with lock-shields.

Stocked by all first-class dealers. Catalogue mailed free upon request.

JENKINS BROS., LIMITED

103 St. Remi St.

MONTREAL



Fig. 168.



Fig. 169.



Fig. 175.



Fig. 181.



Fig. 167.



Fig. 174.

K E R R

(New "KEYSTONE" Pattern) GATE VALVES



If you have not used any of these New Pattern Valves, specify "KERR" in your next order. We want you to get acquainted with the most reliable valve on the market.



If you have been using them, we are confident that your satisfaction will bring us your repeat orders. These valves will never cause you or your customer the slightest trouble. Their high quality is consistent.



When you buy a "KERR" Valve you get a guaranteed article that is backed by a reliable firm. Many of the largest distributors of valves in Canada have sold "KERR" Valves for over 25 years, and are still recommending them as the "Best Valve."

Write us for particulars.

Kerr Engine Co., Ltd.,

Valve Specialists

Walkerville, Ont.

TRADE MARK
GALT BRASS

Overflow Tube
Telescopes

Waste Tube
Telescopes

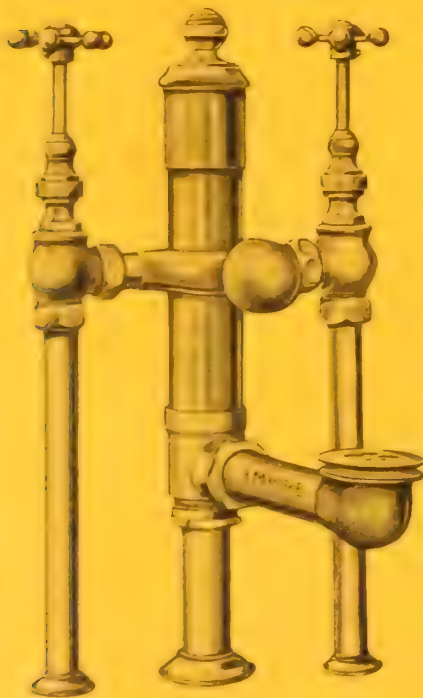


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Connecting
THE
"ADJUSTO"

Cast Brass Strainer
Cast Brass Waste Plug
Cast Brass
Coupling Nuts

Manufactured
only by

GALT BRASS CO., Limited, GALT, CANADA



Sitz Bath Set of Bell Supplies and
Waste

The Figuring of time is al-
ways the Sticker on any job

On any large contracts there is always an allow-
ance made for unforeseen troubles over and above
the possible minimum time.

If you want to minimize this item and add it to
your profits use

EMPIRE PLUMBING GOODS

All our fittings are made to standards and thor-
oughly tested and inspected before leaving the
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tures they are intended for.

If you have not used them, specify them in your
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